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THE
PLANTER'S KALENDAR.

THE
PLANTER'S KALENDAR;
OR THE
NURSERYMAN'S & FORESTER'S GUIDE,
IN THE OPERATIONS OF
*THE NURSERY, THE FOREST, AND
THE GROVE.*

BY THE LATE
WALTER NICOL,
AUTHOR OF THE GARDENER'S KALENDAR, &c.

EDITED AND COMPLETED
By EDWARD SANG,
NURSERYMAN.

SECOND EDITION, IMPROVED AND ENLARGED.

EDINBURGH:
PRINTED FOR ARCHIBALD CONSTABLE AND CO. EDINBURGH;
LONGMAN, HURST, REES, ORME AND BROWN, LONDON.

1820.

P. NEILL, *Printer.*

PREFACE

TO THE
FIRST EDITION.

WHEN Mr Nicol published his Gardener's Kalendar early in the year 1810, he announced his intention also to produce a Planter's and Nurseryman's Kalendar. In order to render this projected publication more perfect, he made an extensive Tour through England, in the course of the summer and autumn of that year ; visiting many of the principal forests and plantations, and the most distinguished seats of the Nobility and Gentry, in that opulent country, together with the chief nurseries near the metropolis ; and taking notes of the state of the forests and plantations, and the different modes of management pursued by the most eminent nurserymen and experienced foresters. It may scarcely be necessary to remark, that Mr Nicol was previously well acquainted with the practice in Scotland ; he having many years ago published the *Practical Planter* ; a book very favourably receiv-

ed by the Public, and which has been frequently reprinted.

Upon his return to Scotland he began this work. He had made some progress in it, when he was seized with a severe illness, which entirely interrupted his labours, and which ultimately proved fatal in the spring following.

Having been requested by Mr Constable to complete the undertaking, I carefully examined the notes and references left by the deceased ; and I had the mortification to find, that, however useful and important they might and would have been to himself, they were in many cases useless to any one else. My task, therefore, proved much more serious than I had anticipated.

I enjoyed, indeed, some advantages. Mr Nicol was a near and an esteemed relation : I had lived in habits of the greatest intimacy with him ; and was perfectly well acquainted with his professional opinions and practice.

Still, however, so much remained undone, that, had not the subjects treated of been familiar to myself, I should have declined interfering. But, having been personally en-

gaged from my earliest days in raising trees from seeds in the nursery, and attending the planting, pruning, and future management of them in the forest and other situations, I felt some degree of confidence in my own experience ; and I trust, therefore, that I shall not be deemed presumptuous for having, in these circumstances, undertaken the finishing and editing of the *Planter's Kalendar*.

Founding on my own practice and experience, I have, where left entirely to myself, felt it my duty, on one or two occasions, to give opinions and advices different from those delivered by my friend in his *Practical Planter*, already mentioned. I allude, in particular, to what is said concerning the pruning of Firs and Larches in the forest and the grove ; the manner, in some instances, of pruning young hard-wood trees ; and the rules to be observed in pitting of grounds, according to their nature and other circumstances. These matters were occasionally the subject of friendly discussion between us. In the following work, I thought it better at once to state my own views, than to have first brought forward Mr Nicol's, and then, in effect, to have confuted them, which

a regard for the truth would have required of me.

I feel that, on other grounds, some explanation, and perhaps apology, is due to my brethren in the nursery line. It may possibly be thought, that I have in some instances revealed too freely the secrets of the business. But, what is of more consequence, wherever the scene of planting is extensive, I have strongly recommended the establishment of *private* nurseries ; and I have decidedly advised the *sowing* of the larger kinds of tree seeds, such as acorns, chesnuts and walnuts, in the spot where the trees are destined to grow, in preference to the *planting* of young trees taken from any nursery whatever. For these things I alone am responsible.

In my defence, I may appeal to every patriot Briton, as to the extreme importance of adopting the most speedy and effectual measures to increase the quantity of forest plantation in these Islands, in order to meet the extraordinary expenditure of our native timber which is now unavoidably taking place, owing to the unparalleled war which has closed the usual sources of our supply

from the Continent. Now, where the designs are extensive, the planting will certainly be greatly facilitated and forwarded by the formation of private nurseries; and in no other cases will such nurseries ever be found advantageous. Further;—few, I presume, would be found disposed to dispute the proposition, that private emolument ought to give way to the general good. Besides, if individual emolument is really to be thus lessened, I cannot be supposed destitute of a fellow-feeling on the subject; my own livelihood, and that of a numerous family, depending on the public nursery business.

But, after all, I have very little dread that either my own business, or that of my neighbours, will be hurt by the means alluded to. On the contrary, I am inclined to think, that if numerous private nurseries were established, they would tend to make the spirit for planting become more and more general, greatly to the advantage of those concerned in the business of public nurseries.

The plan adopted in the following work, as now completed by me, differs but little

from that sketched out by the late Mr Nicol, and published at the end of the Gardener's Kalendar.

In the Introduction, I have endeavoured to enforce the momentously important doctrine above hinted at, of laying a foundation for the future supply of native timber, not only for domestic and agricultural purposes, but for the BRITISH NAVY, that last and glorious palladium of the liberties of Europe.

The proper situations and soils for a Nursery are then treated of; and, in succession, the soils and situations best calculated for Forest and Grove plantations, and for Woods and Copses.

The different kinds of Forest Trees are next characterized; and this part of the work is closed with a short view of the advantages to be derived from planting.

The *Kalendar* follows; and, in it, for every month in the year, the work to be particularly attended to during each month, is distinctly stated under the respective heads of Nursery, Forest Plantation, Ornamental Plantation, Copses, and Fences.

In order to illustrate some things more perfectly, three engravings are given. In the first, I have exhibited the general appearance of two properly pruned grove trees, the one thirty, and the other ten years of age, and of one that is improperly pruned. In plate second, the baneful consequences of bad pruning are exemplified in two planks, figured from nature. In the third plate, the various implements more particularly alluded to in the course of the treatise are represented.

In an Appendix I have given full instructions for the formation and management of Osier plantations; and have described the different species of willows best suited to this purpose. I have added some tabular views, which I judged might prove both entertaining and useful.

Although, in a few instances, the practice recommended in this treatise may be more immediately calculated for the climate of Scotland, I have constantly kept in view the possibility of the book being consulted by English or Irish planters and improvers; and I flatter myself, that, if it be, they will have no cause to repent.

Being a Scotsman, I take it for granted that I may insensibly have fallen into *Scotticisms*, as they are called, in attempting to write English. I have sometimes also intentionally employed expressive Scots terms; and where I supposed these might be unintelligible to my Southern readers, I have taken care to explain their meaning. As to the general style of the book, (for which I consider myself answerable, having in a great measure moulded Mr Nicol's observations into my own style); if I have succeeded in being tolerably plain and perspicuous, and not very ungrammatical, this is all I have aimed at, and all, in my opinion, that ought to be required of a practical man.

EDW. SANG.

NURSERIES, KIRKCALDY, }
1st April 1812. }

PREFACE

TO THE

SECOND EDITION.

SEVEREN years have now elapsed, since the First Edition of this work was laid before the Public. At a very early period after its publication, I anticipated a demand for another, and prepared for it accordingly. Every new fact in the science with which I have since become acquainted, and which I considered of sufficient importance, has been introduced. In short, I have laboured to make this edition as complete as circumstances would allow ; and I flatter myself it will be found generally useful. Although much new matter has been introduced, it has not swelled the apparent size of the book, owing to the printing being more condensed.

The progress of knowledge in any science is slow, and, it may be, in none more so,

than in the cultivation of trees for Timber. This arises from their almost imperceptible growth to maturity, and likewise in their very slow progress to decay. In our early days, we are familiar with stately trees, to which, in the evening of our lives, we bid adieu, without having perceived any great change on their appearance. Hence the experience only of several generations can afford deductions sufficiently to be relied on, in some parts of this interesting science ; while, on other parts of the subject, personal experience is our surest guide.

The wide deviations from some of the tenets taught by my late respected friend Mr Nicol, in his Practical Planter, were submitted to the Public with some hesitation and reluctance ; but those being founded on my own experience and observation, I felt it my duty to recommend them ; and I feel much satisfaction that they have been favourably received by discerning readers.

Some of my brethren in the Nursery line were apprehensive, that a work of this kind might prove prejudicial to their business ; but I am glad to find, that this notion has passed away. Indeed, it is evident that the

more generally the knowledge of any science is diffused, and the more clearly its advantages are pointed out, the more readily will it be cultivated. The more that landholders study the Planter's Kalendar, the more will they be inclined to plant. Nay, even the cheap and easy methods of forming plantations recommended in the Kalendar, instead of injuring the nursery business, have become the means of promoting it.

The Kalendar was originally intended chiefly for Scotland, but I perceive with satisfaction, that it has been consulted and acted upon also in England and Ireland. The countenance bestowed upon it by Noblemen and Gentlemen who have planted extensively in these countries, has induced me, in this new edition, to offer my views to the consideration of every planter in the kingdom. If the work shall be the means of farther encouraging the cultivation of Trees, and thereby promoting the interest of my country, I shall feel myself amply rewarded.

The unparalleled war alluded to in the preface to the first edition, ended in a manner and at a time the most unexpected. Though the result has been glorious to our

arms, we are not likely soon to enjoy all the advantages of a state of peace. But if the general prosperity of the country cannot at present be held forth as an encouragement for planting, another and a powerful motive may surely be found in the immediate benefits which may thus be conferred on the labouring classes, during the present scarcity of employment; while the planter may have the satisfaction of knowing that he is at the same time promoting the resources and ornament of the country, and increasing the ultimate value of his own domains.

E. S.

NURSERIES, KIRKCALDY, }
 7th February 1820. }

THE Editor contracts for the execution of all kinds of Forest and Ornamental Plantation.

He reviews neglected Plantations, and gives Directions for their future Management.

** * * Letters addressed to EDWARD SANG, Nursery and Seedsman, Kirkcaldy, will be duly attended to.*

CON.

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EXPLANATION OF PLATES.



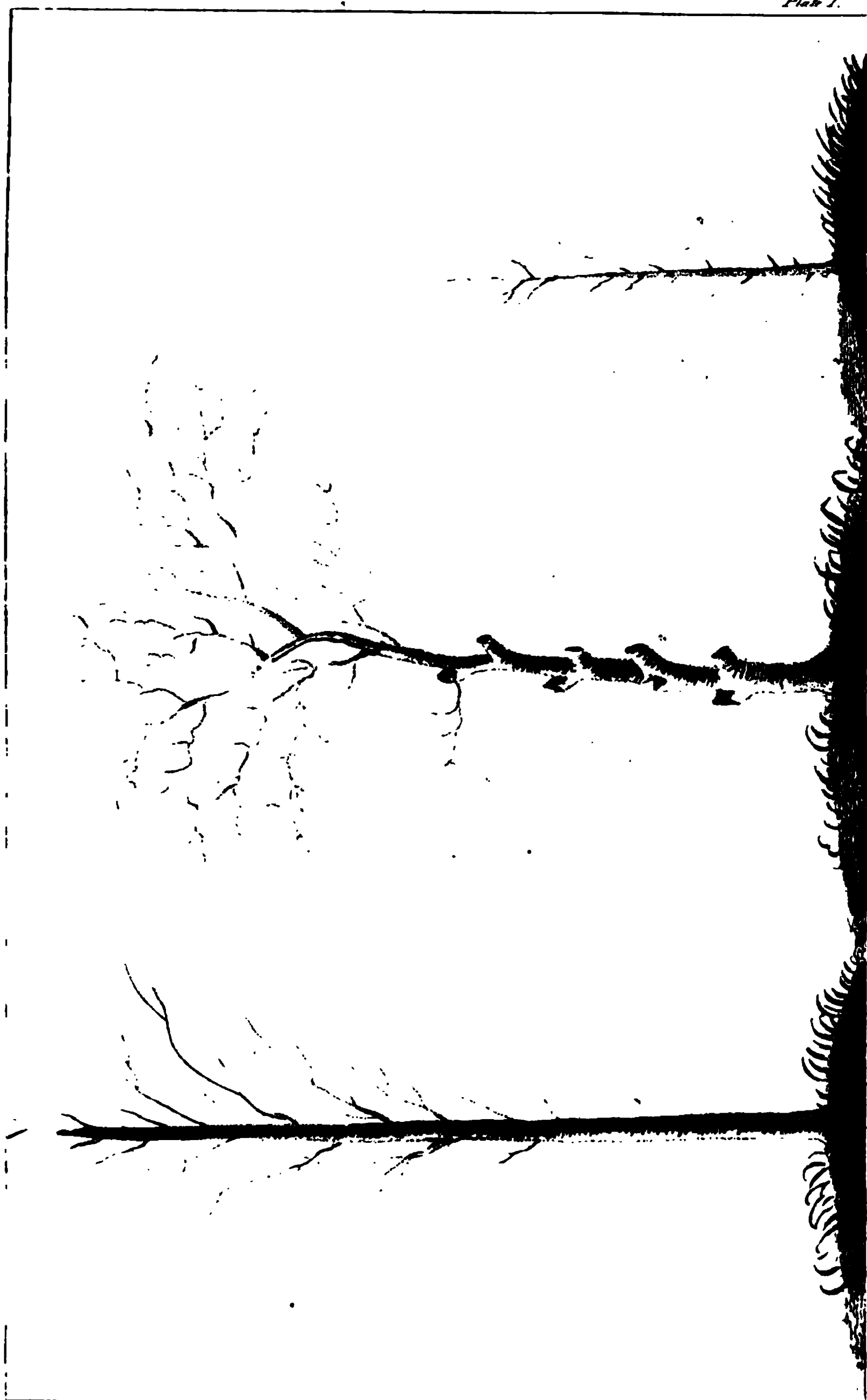
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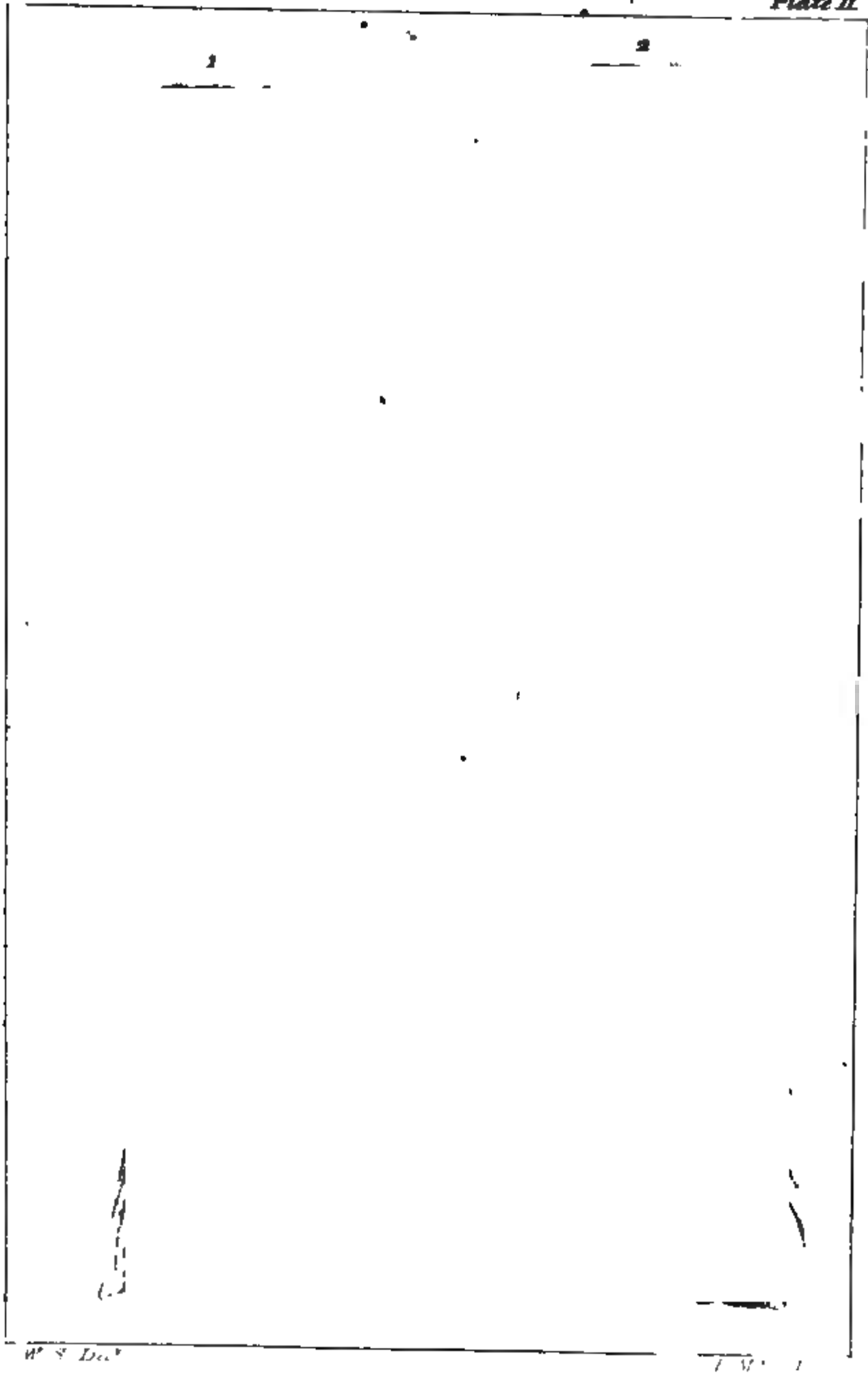
**[The Binder is requested to place each Plate fronting its
Explanation.]**

EXPLANATION OF PLATES.

PLATE I.

- FIG. 1.** Represents a tree in a grove or thick plantation of thirty years of age; which has been regularly and properly pruned from infancy onwards.
- FIG. 2.** Represents a tree of the same age, on the skirts of a plantation, which has been neglected in the pruning from infancy onwards; and which now being pruned in a way too frequently practised, is left in a state highly injurious to its health, and destructive of the soundness of its timber: For it is manifest, that before the bole can be enlarged sufficiently to cover the stumps of branches left, many years must elapse; these stumps must become rotten; and consequently the timber will be useless, and probably the plant itself may be killed.
- FIG. 3.** Represents a grove, or an ordinary plantation hardwood tree of ten years of age, clothed with a sufficient number of branches to secure the extension and enlargement of the bole.





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FIG. 1. Represents a board or plank from an ash tree which grew on the estate of Balgrigey, in Fifeshire, and which had been pruned many years ago. The cuts, in this case, had been made several inches from the bole; and the branches being very large, the stumps left had become rotten. The enlargement of the trunk, however, had not been stopped, for the new wood had covered over all the haggled parts, in some places to several inches thick: Yet the effects of the previous exposure to the action of the weather, by injudicious pruning, is strikingly marked by the decayed state of the parts connected with the branches which had been amputated.

FIG. 2. Represents another board of ash wood from a tree which grew at the same place. This tree had been long neglected in the pruning: but at last it had been pruned, when the plant was nearly the size of the part of the plant represented by the dark colour. The branches had been cut off in a careless manner, somewhat in the manner represented at Fig. 2. in Plate I. After these had become rotten, and had dropt off, or been broken off, the new wood had by degrees covered the blemished parts on the trunk; but not until they had been the means of introducing a quantity of moisture sufficient completely to destroy the interior of the trees. Both these planks were cut up from trees felled in autumn 1811.

FIG. 1. Represents the *Diamond-pointed Dibble*, described, together with its uses, at p. 348.

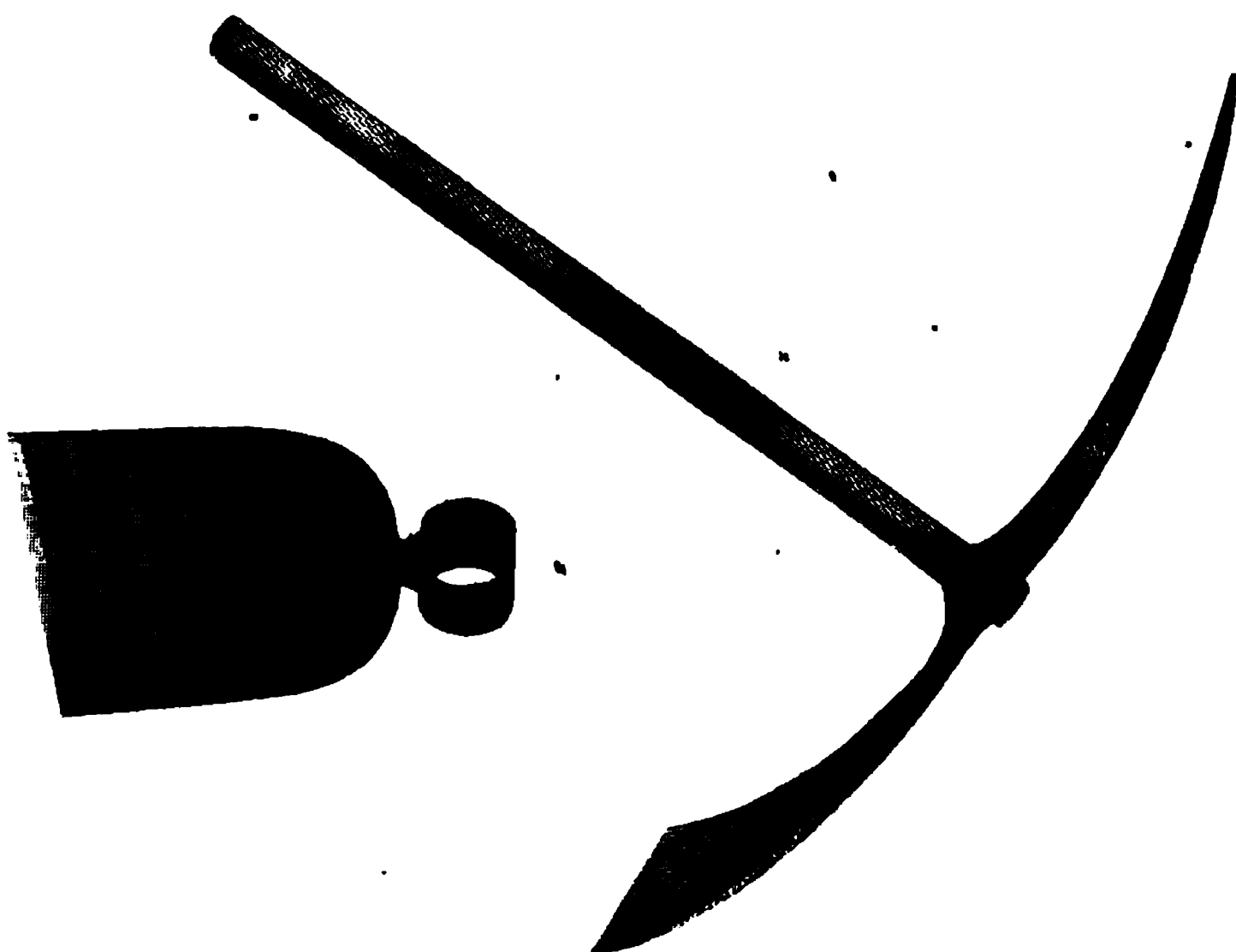
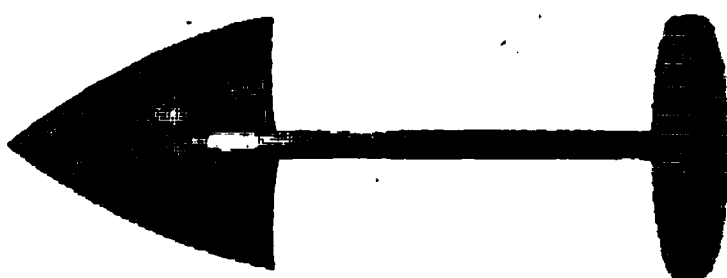
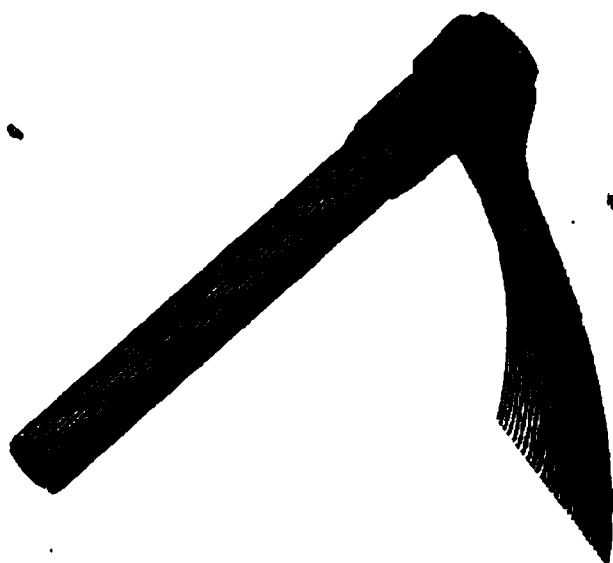
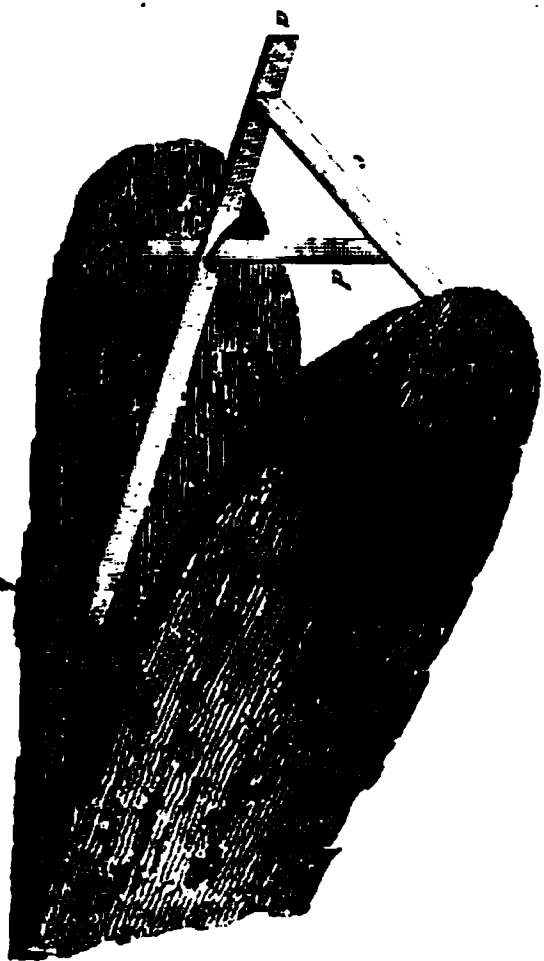
FIG. 2. The *Hand Mattock*, alluded to p. 194 & 385. The helve is 3 feet 6 inches long; the mouth is 5 inches broad, and is made sharp; the length from it to the eye, or helve, is 16 inches; and it is used to pare off the sward, heath, or other brush that may happen to be in the way, previous to easing the soil with the other end. The small end tapers from the eye, and terminates in a point, and is 17 inches long: It is used for opening the soil, instead of pitting; and in hilly or stony ground, it is a very useful tool.

FIG. 3. The *West Indian Hoe*, recommended for deep hoeing, p. 337.

FIG. 4. The *Planter*. The helve is 16 inches long, the mouth is $4\frac{1}{2}$ inches broad, and the length of the head is 14 inches. The instrument is used in planting hilly ground, previously prepared by the hand-mattock. The person who performs the work carries the plants in a close apron; digs out the earth sufficiently to hold the roots of the plant; and sets and firms it, without help from another: It is only useful when small plants are used, and in hilly or rocky situations.

FIG. 5. The Nurseryman's *Mouse Trap*. This trap is described in p. 248.

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1895.5.14

THE
PLANTER'S KALENDAR.

INTRODUCTION.

PERHAPS at no period of the history of this country, has a spirit for planting prevailed more among private individuals, than within these last thirty years. Surely at no period of our history was ever such a spirit more desirable, considering the decrease of trees in our national forests, the high price of timber in all parts of the country, and the difficulty of obtaining foreign supplies of that article. The extensive scale on which plantations in this country have lately been conducted, particularly in Scotland, certainly reflects very high honour on the landholders of the present age. It is not now, therefore, so necessary for us to call loudly on the proprietors of land, especially in the northern part of the kingdom, to plant, (as has uniformly been done by late writers on this subject), as to take proper care of that which is already planted. The business of planting is now established on a broad basis, and has become more or less the care of every great landholder in the

kingdom ; and as there appears to be a conviction of its propriety, and a due sense of the returns to be ultimately derived from it, in the mind of every thinking man concerned, there need be little fear of the zeal for planting being slackened. It would be well, however, that as much anxiety were displayed in some other parts of management,—the properly thinning out and cultivating plantations, and the reclaiming of neglected woods and copses.

A serious conviction of the immense loss which the country has already sustained, by the neglect of its plantations and woods, *strikingly visible in every part of it*, has led us to turn our whole mind to this subject ; and such loss cannot certainly be a matter of indifference to any well disposed member of the community. While we regret the past, let us welcome a dawn of hope in regard to the future management for the better ; since we see an example set, by some of the great proprietors of land, in various districts of the country ; and an indication of others being disposed to follow ; as in many recent improvements in agriculture. Although precept upon precept (many of them good) have been laid down, by writers on this subject, for the last forty years, it may truly be said, that, with a very few exceptions, all such precepts remain unheeded. A few proprietors of wood have at length thrown off the trammels of prejudice, and, in introducing their improved modes of management, have not scrupled to cut, not only

what their fathers, but what themselves have planted!—sinners, of course, in the eyes of thousands;—but, in the eyes of common sense, no more so than he who hoes out, to a proper distance, an acre of carrots or turnips.

While such management is commendable in the highest degree, in so far as respects the thinning of the trees in plantations, to proper distances; we have little reason to fear that it will ever lead to the premature felling of timber. The recent high price of that article has, no doubt, in several parts of the country, had this effect, especially in so far as regards *fir*-timber; but it is questionable whether a much more than ordinary cutting of young improveable *hard* timber has taken place, either in England or Scotland. Of timber come to maturity, a very great quantity has doubtless been cut of late years. The demand occasioned by the extraordinary increase in machinery, both in our manufactories and in husbandry, may be assigned as the chief cause.

With respect to Oak woods and copses, the very high price of oak-bark, for the last seven years, has unquestionably led to many premature falls, and has rendered some proprietors less careful of *reserves* or *timber-stands*, than might have been prudent. This is the more to be regretted, that, by a certain mode of management*, differ-

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* Described in a subsequent part of this volume, under the head *Woods and Copses*, for *May*.

ent indeed from the common, an equal return of bark might, in most cases, have been obtained, and the timberlings at the same time spared—to grow to maturity, in due time, for the future increase of our trade, or the defence of our shores.

It is a very important, and, in our opinion, a demonstrable fact, that even in the natural woods scattered over many parts of the *Scots Highlands*, there might be reared, with much expedition, an immense supply of capital ship-timber.

With respect to a proper supply of timber for the British Navy, and the neglect of the Royal Forests, there has been a continued hue and cry for the last forty years; yet Government, till of late, seems to have paid little or no attention to the matter. Whether this indifference on the part of Government, has or has not had the good effect of making *individuals* turn their minds to the subject, and plant on their private properties, is a point which remains doubtful with many. One thing, however, we are very certain of,—that, within the period above mentioned, there have been many more trees planted in Britain, than there were in the days of EVELYN, in consequence of his remonstrances to the Government of his time.

Fashion, no doubt, has great weight; and an improved taste with regard to the embellishment of estates, has fortunately led to much planting in the vicinity of residences; but something more than fashion has brought about the widely-extend-

ed system of planting on many estates, particularly in the North. We are willing to allow every thing on the score of patriotism ; but surely *a wise foresight*,—a just calculation of the ultimate results,—has, with perfect propriety, had a signal share in the matter. We may remark, also, that, by an improved system in the manner of planting, in the choice of kinds, and sizes of the plants, the expence may now be justly estimated at one-half less than it was thirty years ago ;—a circumstance which, of course, has had considerable influence in the encouragement of planting. The great attention paid to agricultural improvements, has likewise proved very favourable to the increase of planting ; it having been clearly perceived, that, by subdividing extended tracts of country, by means of screen-plantations, (generally denominated *stripes* or *belts*,) and by trees in masses of various shapes and dimensions, the interests of husbandry must be very much promoted by the protection thus afforded to the corn lands ; and, when the rearing of stock became a matter of the utmost importance, the sheltering of their pastures could not be overlooked.

A regard to the present scarcity, and high price of timber, both of home and foreign growth, is certainly a most serious consideration. We have got into a difficulty, with which we must undoubtedly struggle for a time ; but we are fully convinced, from a very minute examination of the quantity

of growing timber in England, and in Scotland in particular, made within the last fifteen months, that, in the space of fifty years from this date, we shall possess an internal supply, equal to all our wants; certainly in a much shorter period, for all purposes, excepting those of *large ship-building*.

When this is said, let it not be for a moment inferred, that we think the extent of planting may or ought therefore to be curtailed. Far from it. The astonishing increase of our trade, of our manufactures, and of our agriculture, and the incessant demands of that Navy, to which, under Providence, these owe their prosperity, and we our liberty and security, powerfully forbid it. Far from relaxing, we would willingly see the resolution adopted, of importing *no timber*, excepting from our own colonies, so as to render the business of planting and cultivating timber at home as necessary and as permanent as that of agriculture; of which, in truth, it certainly is a most important branch. There is, and long will be, an ample sufficiency of waste land within the British Islands, for all the purposes of planting, exclusive of what may be most advantageously appropriated to the raising of grain, and the rearing of stock.

The letter of the late LORD MELVILLE, to Mr PERCEVAL, on the subject of Naval Timber, published in July 1810, is so much in point here, and contains so much important matter on this subject, that we cannot forbear making some extracts

from it. Flowing from the pen of so able a writer, and dictated by a judgment so sound, and a knowledge so extensive, these remarks must carry conviction along with them ; and it is not likely that any reader will think them too long.

His Lordship, after recapitulating, in his letter, the heads of the Report of the Commissioners of Land Revenue, appointed by Parliament in 1792, to inquire into the condition of the woods and forests of the Crown, states their general conclusion to be,—“ That if the prosperity of this country should continue, the consumption of oak timber, for its *internal* purposes, and for the shipping necessary for the whole of our *trade*, including that of the East India Company, would, at no very distant period, furnish an ample demand for all that could be expected to be produced on *private property* in this kingdom ; and that such was the existing state of the growing timber, and the prospect of future supply, that this country would, in all probability, experience a *fatal want* of *great oak timber*, and become dependent on other powers for the means of supporting her Navy, if care should not be taken to provide a supply in future, by the improvement and better management of the Royal Forests ; and to reduce the consumption of it, by the utmost care and frugality in the expenditure.”

His Lordship then proceeds thus :—“ The Commissioners then enter very fully into reasons for believing, that, if no delay were allowed to take place,

in the adoption of the measure recommended for the preservation and improvement of the Royal Forests, that resource alone would be found sufficient to afford an annual supply of timber, to the extent then required for the Navy, namely, 50,000 loads *per annum*. But none of those plans having, in any material degree, been acted upon, I shall now proceed to contrast the amount of the consumption of timber at the present time, with the extent of consumption as given by the Commissioners of Land Revenue, and before detailed.

“ As to the consumption for the internal purposes of the country—When we reflect upon the very extensive and rapid demands, which must necessarily have been occasioned by the numerous canals and wet docks, which the spirit and industry of private enterprise have formed within these few years,—upon the more general use of machinery, now, than at the time those Commissioners wrote,—upon the increased consumption of oak timber in mill-work, engines, lighters, barges, and all the other purposes before enumerated, which depend upon the population, manufactures, commerce, agriculture and wealth of the country, all of which, it cannot be denied, have, since the year 1792, when the Commissioners of Land Revenue made their Eleventh Report, increased to a degree that cannot fail to excite our admiration and astonishment ;—and when, in addition to all these facts, we advert to the circumstance of the great advance

in the price of fir timber, since the northern shores of Europe have been under the dominion of France, (being in many parts of the country as dear as oak,) we surely cannot but be convinced, that a very great increase in the consumption of oak timber, for the internal purposes of the country, must have taken place between the year 1792, and the present time.

“ It must be equally obvious, that a very considerable increase has also taken place in the consumption of timber for the merchant shipping of this kingdom, since the period I am alluding to.

“ The registered tonnage of the vessels belonging to the several ports of the British empire in the year 1808, appears, by the accounts laid before Parliament, to have been 2,324,819 tons; and, following the same rules for judging of the consumption of timber, as those adopted by the Commissioners of 1792, it appears, that the annual consumption of timber, under this head, may be reckoned at 249,087 loads; being an increase, in eighteen years (since 1790), of no less than 90,408 loads annually.

“ It becomes obvious and important to make one comment in this place, namely, that this very great increased demand for timber of the *middling* sizes, must tend most powerfully to encourage the felling of oak trees, *before* they arrive at a size fit for the *essential uses of the Navy*.

“ With regard to the consumption of timber for the Navy, it follows, that as the tonnage of the

Navy is now near *double* the amount of what it was when the Commissioners of Land Revenue made their Report, or about 800,000 tons, so the consumption of oak timber must have increased in proportion ; and thus it cannot now be fairly considered at less than 100,000 loads *per annum*.

“ From what has been stated, it is thus evident, that the consumption of timber under the three heads, namely—for the *internal purposes* of the country—for the *commercial shipping*—and for the *ships of war*, has very materially increased, since the Commissioners of Land Revenue made their 11th Report.

“ The consumption under the first head, cannot be estimated nor compared, for reasons already given : But that under the other two heads may be contrasted as follows :

	1788.	1808.
	LOADS.	LOADS.
Commercial shipping, -	158,000	249,000
Navy, - - -	50,000	100,000
	<hr/>	<hr/>
	208,000	389,000
		<hr/>
		208,000

Making an increase *per annum* of 141,000

“ I have said in the beginning of this letter, that it was not my intention to disclose any thing on this subject, which his Majesty's Government had thought it expedient to conceal. But, in fol-

lowing this course, I certainly act more in acquiescence to the opinions of others, than from any exercise of my own judgment. If there are any parts of the Fourteenth Report which it is expedient to conceal, still much useful information might be given to Parliament and the public, consistently with such a reserve. I am not aware, that any good can result from such a determined concealment. If, as I have already observed, there is just cause of alarm, from the increasing decay and scarcity of an article so essentially necessary to the empire, the knowledge of such an impending danger would be the strongest incitement to the public at large cordially to concur in every measure which Government may think necessary to ward off so serious a calamity. If an example be wanting of the benefit to be produced by the diffusion of a knowledge of the state of timber in the kingdom, a very strong proof is to be found in the effect which was produced by the writings of Evelyn, soon after the Restoration, which excited a spirit of planting throughout the kingdom; and the Ministers of that time, alarmed at the desolation which had been committed during the civil wars, gave great attention to the preservation and increase of timber in the Royal forests, particularly the Forest of Dean. As it is almost universally allowed that oak trees, to grow to a size fit for the navy, require from eighty to a hundred and fifty years, according to the quality of

the soil, it is obvious, that the vast quantities of great timber consumed by our navy, during the present reign, were chiefly the produce of the plantations made between the Restoration and the end of the 17th century, on private property, in almost every part of England, as well as in the Royal forests ; and which had been occasioned by the publication of the state of timber in the kingdom, and by looking the danger of a scarcity boldly in the face.

“ It is impossible to take a retrospective view of the details already given, without expressing astonishment that the dangers pointed out should not have excited the most anxious apprehensions. There is no reflecting person in the kingdom who does not feel and acknowledge, that the existence of every thing valuable to us as a nation, depends upon maintaining our naval superiority ; and yet, for more than forty years, we have remained in a state of apparent insensibility, although it has been demonstrated that the article most essential to the preservation of our navy, has been gradually diminishing ; and the causes of that diminution are of a nature not to afford the smallest prospect of a probable change, unless the most vigorous exertions are made to provide a substitute for those resources on which we have hitherto relied, and which we know are in a progress of rapid decay, and of ultimate failure at no very distant period.

“ It would seem as if each successive Government of this country had invariably become disheartened, and had therefore abandoned all attempts to place this important branch of our naval resources upon a permanent basis, because the members of it could not hope to live to see the success of their own measures : But, if this course of policy is to govern all our actions ; if, because we may struggle through the immediate difficulties we have to encounter, and are able to ward off any imminent danger in our own lives, we are therefore to pursue the narrow policy of neglecting to provide for posterity, with what reproaches will after generations load our memory ? Are we not daily pouring out blessings upon our forefathers, for the constitution which they have matured, and handed down to us to enjoy ? But if we omit to take any steps to preserve the means of protecting that constitution, (for without a navy, what will be that constitution ?)—shall we not be certain of drawing down upon us the execrations, instead of the praises, of posterity !

“ I have no doubt what the general tendency of the measures to be adopted for ensuring a permanent supply ought to be ; but I purposely desist from enlarging on them ; because any details of that nature would lead me to state what I have declared my resolution to refrain from disclosing, lest such a publication should interfere with any of the plans which Government may think it ex-

pedient to adopt for ensuring a permanent supply of naval timber, without solely confiding in any of those resources which, from their nature, must be contingent and precarious. I can, therefore, only again recommend to your most serious consideration the whole of the Fourteenth Report of the Commissioners of Naval Revision, bearing always in your recollection two essential considerations. The first is, to take the most effectual measures to husband and preserve, for the use of the Royal Navy, as much of the timber now remaining in the kingdom as you possibly can. The second is, to begin, without delay, to provide, within the kingdom, for the means of supplying the future wants of the navy, when the timber now growing shall be exhausted.

“Adverting to the predicament in which we stand with respect to naval timber, and considering how distant the period is at which we can look to the result of the most wise and vigorous measures we can now resort to for providing a permanent supply hereafter, it is most consolatory to reflect, that, in the interval, there are collateral resources to enable us to husband and economize the remaining stock of home timber, without being reduced to the necessity of making any serious diminution of our naval strength.”

His Lordship then proceeds to mention the resources to be found in our American colonies, our East Indian possessions, and the Island of Tri-

nidad in the West Indies ; recommending, in the strongest terms, the encouragement of the timber trade with America, in preference to the Baltic, should that resource be again opened to us. He particularly notices the value of the teak-wood of India, and hints the propriety of building ships of war of it in that country. He then closes his masterly letter in the following words.

“ I most sincerely congratulate you, Sir, and my country, on the supplies to be derived from these foreign resources, in the view already alluded to, of filling up the space between the exhaustion of our present home stock, and the maturity of the plans which, I trust, will be adopted for the purpose of ensuring permanently a supply of naval timber of British growth. Let it, however, not be forgotten, that all these foreign and collateral resources are more or less contingent and precarious ; and I confidently hope, that the possession of them will not induce his Majesty’s servants to delay attending particularly to the measures recommended by the Commissioners of Naval Revision ; and to every other measure which may have a tendency to secure that permanent supply, which, alone, ought to satisfy a great nation in a concern of such vital importance.

“ Before I conclude, it seems proper to advert to the opinions of those few who contend against the policy of appropriating any part, either of the

Royal forests, or of our other cultivatable lands, to the raising of timber; urging, that it would narrow the field which is required for the subsistence of the country, and is therefore objectionable.

“ There are many fallacies which could be detected, in the reasoning and theories of those who entertain such an opinion. It is a mistake, to suppose that every addition to the extent of the tillage of the country is productive of a proportionate addition to the food of the country. But such a discussion would open a field too wide for the purpose of the present address. A simple statement of the case is perfectly sufficient for the illustration of my sentiments. It is supposed, that, exclusive of the Royal Forests, there are, in Great Britain and Ireland, probably more than eighty millions of acres; of which, perhaps, no part is yet brought to the highest state of cultivation; and that, certainly, not less than twenty millions are still waste. If, therefore, a comparatively very small part of the land of the kingdom is thought essential to be appropriated to the purpose of securing the continuance of our naval strength and pride, it would surely be a very shortsighted policy, which would suggest to this maritime country the expediency of trusting to a commerce, for the supply of our dock-yards with timber; when, without any real risk to the subsistence of the country, and, by a sacrifice com-

paratively small, we can avoid for ever putting to hazard, the supply of an article on which, confessedly, our strength, our glory, our independence, and even our existence as a nation, must now, and at all times, depend."

This letter speaks not only to Mr PERCEVAL, but to every Pilot who shall ever hold the Helm of the Realm ; to every Minister or Ministry ; and to every individual in the empire possessed of landed property. His Lordship's deductions appear to us clear, and his conclusions just. His earnest and impressive injunctions will, it is to be hoped, have their full weight, and sink deep into the mind of every patriot.

However much the facts quoted above from Lord MELVILLE's letter, may be considered by some as reflecting on himself, for inattention to those objects while he was in power and in office ; or, however much the immediate motives, supposed to have produced the letter from which they are taken, may be deprecated by others ; in our estimation, his arguments and deductions remain firm as the deep-founded rock ;—and we feel ourselves exceedingly much indebted for the correct *data* exhibited, and for the conclusions so ably drawn, by his Lordship.

SECTION I.

ON SITUATIONS AND SOILS FOR A NURSERY.

THE rearing of forest trees and hedge plants from seeds, has hitherto been chiefly confined to the public nurseries throughout the kingdom. But although these are numerous, many cases occur especially in sequestered places, strongly requiring proprietors to establish private nurseries of their own, more conveniently situated for the scene of planting.

When nursery plants must be brought from a distance, the carriage greatly enhances their cost. But this is not all. When the distance is very great, the plants must lie so long out of the ground, that they are often much injured. These, with a variety of like reasons, have induced many to raise their own forest trees from the seeds.

Many gentlemen who have a strong desire to raise their forest trees from the seeds, have, in their service, deserving foresters and gardeners, who have not had opportunities of learning the

best methods of doing so ; and with whom, for the sake of their other good qualities, their masters are naturally loath to part.

Some gentlemen so situated, have expressed a wish that we should, in this publication, treat fully and distinctly of the *sowing*, *transplanting*, and otherwise *nursing*, all the hardy and useful kinds of forest-trees and hedge-plants. The remarks contained in this section, and those on *nursing*, throughout the Kalendar, are offered to such gentlemen of landed property, and their foresters and gardeners, as may be inclined to form private nurseries for their own use. We do not wish to interfere with the business of the public nurserymen ; and therefore, the kinds of trees and hedge-plants to be here treated of, shall be limited to such chiefly as are hardy, easily reared, and most desirable in a private nursery. It is to be understood, further, that our observations on the situations and soils proper for a nursery, are only applicable to private nurseries at gentlemens' seats.

Many people have been of opinion, and some are so still, that trees, in order to their being rendered sufficiently hardy, should be reared on the soil and in the situation, where they are ultimately to be planted ; or at least in a soil and situation as nearly similar as possible.

If the soil and situation in which the trees are ultimately to be planted, be favourable, we can see no solid reason for objecting to such a plan ;

particularly if the design be extensive, and such as may require many years for its completion ; because a conveniently situated nursery is, in that case, highly desirable, not only as saving the carriage of plants, and facilitating the business of transplanting, but as increasing the chance of success, on account of the plants remaining a much shorter time out of the ground, than if brought from a distance. But if the situation ultimately destined for the trees be cold, high and bleak, and the soil of course various ; some good, and much of it bad, or of an indifferent quality ; *there* it would by no means be advisable to attempt the establishment of a nursery, and especially a nursery to raise plants from seeds.

The chief properties of nursery plants intended for transplanting, consist in their strength and cleanness of stem, and in their roots having a multiplicity of healthy fibres. In order to obtain plants possessing these qualities, it is necessary to sow, and plant out to nurse, if not in rich, at least in mellow earth, and in a moderately sheltered situation. The more delicate kinds of seed, such as the birch, the larch, and the other resinous kinds, require a mould both rich and fine, and a considerable degree of shelter, in order to obtain one-year old or two-year old seedlings of good quality. It will rarely happen that nursery ground will be naturally too rich for general purposes ; excepting in situations like some of those in the

vicinity of Edinburgh, where the soil is a collection of rich earthy particles, and putrescent animal matter, carried down by the common sewers of the City, and deposited in the meadows. Many acres of ground about Edinburgh are of this quality; and they are certainly more proper for growing kitchen vegetables than for raising young plants for the bleak forest, though they are sometimes improperly used for this purpose.

In order to have a complete nursery, it should contain soils of various qualities; the generality of it should be a light friable earth; a part of it should be of a clayey nature; and another part should be mossy. Each of these will be found peculiarly useful in the raising of the different kinds of young plants.

A nursery may certainly be over-sheltered; but this is likely to happen only in the case of its being very small; for, if it extend to several acres, unless it be surrounded by very tall trees, the area will be considerably exposed. The truth is, no part of the nursery should be either too much exposed, or too much sheltered.

Any aspect from east to west, following the course of the sun, will answer. Ground of an unequal surface is most likely to contain the various soils above mentioned. A nursery should therefore, in general, rise from a level to a pretty smart acclivity; yet no part of it should be too

steep, because it is in that case very troublesome to labour.

The nursery ground may be sufficiently fenced by a stone-wall, or even a hedge, six feet high; and if it be of small size, an acre, or thereabout, it will require no other shelter; but if it extend to four or five acres, it must have dividing hedges properly situated to afford shelter over all the space. The fence, whether of thorns or stone, should be made proof against the admission of hares or rabbits. Both hares and rabbits are most destructive to many kinds of young forest trees, particularly laburnums; indeed, they are so voraciously mischievous, that they often bite over every sort which comes in their way.

The nursery ground should never be encumbered with large trees in the quarters; as apples, pears, or the like; because, being already established in the ground, they never fail to rob the young trees of their food, and to cause them to be poor and stunted, unworthy of being planted in the forest.

It is of the very first importance that the soil be completely drained of stagnant water, and freed of *spouts*, or places from which water oozes out. At the same time, it would be very convenient to have a rill passing through the ground, or to have a small pond, fed by a spring or by a pipe, for the purposes of watering.

It will be sufficient that the depth of the soil be from one to two feet, that is, the shallowest parts a foot, and the deepest parts two feet, with various intermediate depths. If broken out from pasture, the ground will require to be trenched, and meliorated by a crop or two of potatoes, turnips, or the like. For these crops it should be well manured, in order to prepare it for receiving tree seeds; or even to fit it for the receiving of seedlings for the purpose of nursing.

We recollect of two instances of nurseries being laid down on old pastures, in which multitudes of the wire-worm, slugs, and other vermin, had long existed. In both cases, it was thought sufficient to subtrench the ground, preparatory to planting out seedlings. But it so happened, that the plants became a prey to these vermin the season following; their stems being found peeled entirely round, about an inch under the surface of the ground, and many of the plants cut quite asunder. That a like misfortune may be avoided, it is proper, even for the sake of transplanted seedlings, were sowing of seeds out of the question, to take a crop or two of grain, or esculents, as above advised.

In most cases, it is advisable to trench the ground to its full depth in the preparation; and if it be anywise stiff, or inclined to wetness, it will be necessary to give it a good dressing of lime or marl, and dung in compost. Rank manure,

such as stable litter, should not be applied to nursery ground, at the time of cropping with nursery articles; but if it be necessary to enrich it, this should be done by a manured crop of onions, turnips, lettuces, or the like. Potatoes should never go before a crop of seedlings, even of the coarser sorts, as ash, oak, or chesnuts; because potatoes never can be taken clean out of the ground; and it being indispensable to pull up those which rise among the tree seedlings, many of these unavoidably come up along with them. Hence, crops of lettuces, turnips, cabbages, or the like, should rather precede the crop of seedlings. The best kind of management, in this particular case, is to interchange the crops of timber trees and esculents occasionally; perhaps, with respect to most sorts of seedling plants, alternately; observing to sow all small seeds, in particular, if not in a rich, at least in a fine tilth.—But this matter will be more minutely directed in the Kalendar.

For a Nursery in the above view, no place, certainly, can be more eligible, than a field which may also be occupied as a kitchen garden. If, for instance, three acres were required for the purposes of *nursery*, and one or two acres were also required for extra kitchen ground, or for green crops for cattle feeding, it would be proper to enclose five or six acres, less or more, according to circumstances; by which means, two important objects might be obtained; viz. land of a good

quality, and fine tilth, for the raising of seedlings ; and an opportunity of effectually changing crops at pleasure.

There is one kind of crop which we judge peculiarly scourging for a nursery, and that is carrots ; they are, indeed, rather severe for most lands ; but we have very seldom found a good crop of trees following one of carrots ; while we have found peas, beans, and especially lettuces, easy and enriching crops, well adapted, as preparers, for succeeding crops of nursery articles.

In so far as respects public nurseries, we have long remarked, that those which are as much market gardens as nurseries, generally produce the best seedlings, and young articles, for sale ; provided that their ground be any thing more than of a middling quality. This fact, if one were wanting, is a sufficient proof of the utility of occupying the ground, as above advised, in the double character of a kitchen garden and nursery.

Thus we have been somewhat particular with respect to the soil and situation of a nursery, supposed to be placed in a favourable climate. A few words remain to be said with respect to such as are less happily situated.

In a cold climate, or bleak situation, with a poor barren soil, we would by no means advise the raising of seedlings. It will be found a cheaper, as well as a more satisfactory method, to purchase seedlings, transplant them, and nurse them

till fit for planting out in the forest ; and, even in this case, a piece of the best and most sheltered land, on the property, will be necessary for the purpose. This piece should be properly drained and improved ; and it should be sheltered, by quick growing hedges of elder, poplar, privet, spruce, larch* or the like, planted at such distances as may answer completely to break the wind ; or by a close plantation of mixed trees and shrubs ; or, both these and the quick-growing subdividing hedges may be used, as need may require. We have already noticed above, the necessity of surrounding the nursery with a fence sufficient to exclude rabbits and hares.

In many cases, a good dose of lime would be a suitable preparative in a new nursery like that in view ; and the more especially, if there be a considerable portion of decayed vegetable matter in it, or if it has been well dunged before. But lime should never be laid upon hungry, new land ; for on such land it will be found to do more ill than good. The soil, at any rate, should be well meliorated previously to planting.

* Larch hedges sometimes become over-run with the *Coccus larixæ*, and communicate this insect to the young larch plants adjoining ; when this is perceived, they should not be allowed to remain in the nursery.

SECTION II.

ON SITUATIONS FIT FOR FOREST AND GROVE PLANTATIONS.

I. *Of Forests.*

FOREST plantations are understood to be extended on a more magnificent scale than ordinary grove plantations. The more extensive they are, the higher will their character be exalted. Indeed, the only distinction between a *forest* and a *grove* plantation, may be said to consist in the extent. We seldom employ the term *Forest*, unless the trees cover several square miles; while every plantation of half an acre may be, and generally is, denominated a grove. Situations for forest plantations, then, may be extremely various. The country to be planted, may be flat, hilly or mountainous; or it may consist of a mixture of hills, dales, ravines, crags and rocks; so as to

make it difficult or impossible to fix on, or describe, its peculiar form.

A flat, barren waste is often appropriated to the rearing of forest timber ; and such are frequently found to be more bleak than the sides of hills of considerable elevation. In the rearing of trees in most situations, sheltering of the plants till they get fairly established in the soil, is a matter of the very first importance. Unless there be natural shrubs growing upon the surface, such as broom, whins (furze), or hazel, artificial means of producing a shelter must be resorted to ; and we shall now consider the means to be employed.

Allow us to premise, that every plain, and most fields and situations for planting, in this country, have what may be called a windward side, which is more exposed to the destructive blast than any other. It is of very great importance to be apprised of this circumstance ; and to be able to fix upon the most exposed side of the proposed forest plantation. Fix, then, upon the windward side of the plain which is to be converted into a forest ; mark off a horizontal stripe, or belt, at least a hundred yards in breadth. Let this portion of ground be planted thick, say at the distance of thirty inches, or at the most three feet, with a mixture of larch, sycamore and elder, in equal quantities, or nearly so, if the soil be adapted for rearing these ; but, if it be better adapted for Scots firs, then let it be planted with them at the dis-

tances prescribed for the above mixture. We have no other kinds that will thrive better, or rise more quickly in bleak situations, than those just mentioned. When the trees in this belt, or zone, have risen to the height of two feet, such hard wood trees as are intended ultimately to fill the ground, should be introduced, at the distance of eight or ten feet from each other, as circumstances may admit. At this period, or perhaps a year or two afterwards, according to the bleak or exposed situation of the grounds, let another parallel belt, or zone, of nearly equal breadth, be added to the one already so far grown up, and so on, till the whole grounds be covered. It is not easy here to determine on the exact breadth of the subsequent belts or zones: this matter must be regulated by the degree of exposure of the grounds, by the shelter afforded by the zone previously planted, and by such like circumstances.

In the formation of forests, we would advise, that the several sorts of timber be planted in distinct masses, which are to be introduced according to the nature of the soil; of which subject we shall treat more fully in Section IV.

These distinct masses, however, it must be observed, should be nursed by larch, or such other nurses as may be suitable to the soil and exposure, until the principals be fairly established, and have grown to the height of ten or twelve feet. The nurses may be to the principals, over the whole

plantation, in the proportion of two to one. Some situations may require three, or even four nurses to each principal, according to the exposed or sheltered nature of the situation, or the quality of the soil. We hold it as the worst of management, to plant thin, or to plant few nurses in exposed situations. It is, however, very difficult to fix upon the exact distances at which the trees should respectively stand ; but the extremes may be fixed, at thirty inches for the least, and four feet six inches for the greatest distance ; or, in some few instances, in very favourable situations, at six feet.

In regard to the size of plants, for the above purpose, a considerable latitude may be taken, provided always that the largest do not exceed eighteen inches in height ; and even such a height is only to be allowed in the case of elders, mountain-ash, sycamores, and such hard-wood plants as are afterwards to be introduced for the principal crop. The larch nurses should not be older than one year seedlings which have been one year nursed in good ground. By that time they will be from six to nine inches high, which is the best possible size ; and if they have been nursed in soft rich earth, their roots will abound with fine fibres. As to Scots firs, they should not be more than two-year seedlings, one year transplanted ; in very bare sandy grounds, they may even be introduced when merely two-year old seedlings. These can

be planted with the *diamond dibble** ; and the cost of planting an acre in this manner is but trifling.

In the extension of a forest on the side of a hill or mountain, by dividing it into zones or belts, in the manner above stated, some degree of artificial shelter may likewise be produced. It is best, of course, to begin at the bottom of the hill or steep ; the current of the wind being generally strongest at the top. When two hills nearly approach each other, and form a dell or deep ravine between them, the wind, in such a case, passes, as if through a funnel, with very great force. It would then, in this case, be proper to plant a large mass on either side, *in the eye of the wind*. Supposing it to blow *most*, as it generally does in this country, from the westward, then should the plantation be begun at that point.

A more favourable site, however, than either of the preceding, for a forest plantation, is a considerable extent of broken ground, consisting of hill and dale, of steeps and hollows, along the sides of a river, or of a brook. Such grounds will be the better for being rather of a north-easterly exposure ; because, in this case, they will not so severely feel the effects of the prevailing blasts from the south-west.

In such broken situations, the plantation might very much extended at once ; as many parts of

Afterwards particularly described and figured.

the ground, from its inequalities, would be well sheltered, and the trees would rise freely, particularly in the hollows, and on the banks of rivulets and rivers..

It is in such situations that Nature has planted most of her forests ; and to follow her plans of procedure, is by far the surest way of securing ultimate success.

The proprietor, previous to commencing the establishment of a forest, will no doubt consider well his particular situation, with respect to a vent for the produce. The vicinity or position of public roads, canals, or navigable rivers, are points of the first consideration ; and, next, the probability of an improvement in these different means of conveying the timber to a market. If his property lie contiguous to a navigable river, a canal, or the sea, his case may then be reckoned most favourable. But though these should be distant, he ought not to be discouraged. Many proprietors in the north of Scotland have been benefited by a method of conveying the produce of their far-inland forests to the ocean, never perhaps thought of by the planters of them. We here allude to the *cuts*, or small canals, made in the forests of Glenmore, Glentannar, and Rannoch ; and to the practice of what is termed *floating*, on the Dee, the Don, the Spey, and other rivers.

Certainly the most favourable situations for forest plantations, in regard to markets, are the banks of navigable rivers, or of canals. But although a great extent of a river should not be navigable, if it be of such magnitude as will readily admit of the timber being floated down, without receiving injury, it may be considered an excellent situation for a forest.

The banks of many such rivers are often bold, steep, and rugged, and consequently of little use to the agriculturist; while, at the same time, the soil is frequently, and indeed generally, of a nature highly fitted to produce the most valuable sorts of forest timber.

If a navigable canal pass through a barren, hilly country, this circumstance puts the proprietors of the district nearly on an equal footing with proprietors in the last stated case; although it must be confessed, that such soils and situations are less favourable to the raising of timber. Yet, by strictly observing to plant thick, and with small well-rooted plants; and by following some other rules, applicable to planting in such situations, to be found in the sequel, much valuable timber may be reared, even in a country characterized both as barren and hilly.

Another kind of situation for forest plantation demands our notice, namely, the bleak banks on the shores of the ocean. To places which lie somewhat *inland*, though on a large scale they

may properly enough be reckoned in a maritime district, much of what has already been advanced is applicable. We would therefore be understood, in the observations now to be made, as chiefly confining ourselves to the banks immediately on the shores of the ocean, or its more considerable inlets.

Such situations have been reckoned the most untoward of any for rearing timber; and many have had sufficient cause, in their experience, to acknowledge the truth of this opinion. The fact is, that, very generally, the want of success has been in consequence of planting *thin*, and with large plants, especially in situations much exposed*.

* The error of using *large* plants in any exposed situation, has operated very much against the interests of planting; not only in maritime situations, but in others which might be thought more favourable. The Scots probably learned this practice from the sister kingdom; for to this day we see all over England, plants of five, seven, and even ten feet high, stuck into places very much exposed. Plants so far advanced should never be employed: the consequence of using them is, that even in the most favourable places, many of the plants never vegetate; and in those much exposed, perhaps not one plant in four shows a leaf the second year. The truth is, the more exposed the situation, the smaller should the plants be, even down to ten, nine, eight, seven, six or five inches in height.

It is a very general opinion, that sea air is more noxious or unfavourable to the growth of trees, than of grain or

We are here to distinguish between the banks of the Thames, the Severn, the Humber, the Solway, or the Clyde, and those of the open sea. On the former where the tide flows for many miles, we meet with multitudes of thriving plantations; and many situations well adapted for rearing of others, where no more than ordinary care has been or may be necessary; and we also find some situations of an opposite description, which we would wish to class with the bleak brinks of the open ocean.

When the bank is highly elevated above the level of the sea, success may be more reasonably expected, than when it lies low and flat; provided the soil of the higher ground be not materially

herbage; which opinion is strengthened by the circumstance of trees, planted near the sea, being very generally stunted in growth. It may here be remarked, however, that it uniformly happens, that the larger the trees have been when planted, so much the more are they stunted. We are fully of opinion, that there must be a defect of method, or too great a change of soil and climate, or perhaps both, when trees cannot be raised on the banks of the sea-shore. The bleakest of our coasts have formerly been covered with wood; as the many large trees dug out of the mosses in the maritime district of Buchan, and elsewhere, fully evince. Even more durable remains exhibit the fact. We know of a number of roots of petrified trees, on the margin of the sea, between Dysart and Wemyss in Fifeshire, at present standing in a puddingstone base.

worse, than that of the lower or more flat ground ; which however it generally is.

There is what seamen term *a lull or lee shore*, which extends in breadth from five hundred to two thousand yards, more or less, according to the steepness or flatness of the bank ; the current of wind passing in a direct line between some certain point on the surface of the water, and the summit of the bank. Supposing this to be the case, must not the lower part of the sloping bank be equally included in the *lull* with the margin of the water ? In the other case, namely, where the land rises but little above the level of the water, the wind passes, as it were, over one continued plain ; accumulating humidity and cold, and increasing in velocity, till it wreak its vengeance on some distant high ground.

Thus the plantation situated on the elevated sea-bank, excepting such part of it as extends to the very summit, may be more sheltered, and better secured from the bad effects of strong prevailing winds, than that situated on the plain, which extends to the margin of the water, without an adjoining elevated ground to break their desolating force.

These considerations naturally suggest the propriety of planting in the one case, on the face of the sloping bank, and considerably within the level of the summit, in order that the trees may have shelter from the current of wind till they ar-

rive at the height of ten or twelve feet, and so become a screen to any succeeding plantation which may be made higher up. It is only by attending to such methods that we can expect to surmount such natural difficulties. In the case of a level shore, it is best to plant in zones; beginning first at the extremity of the proposed plantation or forest which is to be nearest to the margin of the sea. For bleak situations much exposed to the sea breeze, the most desirable plants for nurses are the Elder and the Sycamore*; a part of the nurses, however, may be Scots Firs and Pinasters; the whole should be planted very thick, and treated as noticed above for bleak situa-

* The Elder and the Sycamore should be plentifully planted as nurses to masses of Oak, Elm, &c. as they are known to stand the sea air, and bear up against gales of wind better than any others. The Pinaster also thrives near the sea on the western coasts of Scotland, and may therefore be tried as a nurse. This plant, however, has been tried without success on situations exposed to the blast off the German Ocean. Scots firs will endure the severity of the blast well, and should be intermixed in zones of such nurses as the above; because they keep on their leaves during winter; and prevent the winter blast from seizing on the tender shoots of the other trees. In situations like the above, Larches will hardly succeed; they will become much bent by the breeze, and so may prevent the principal crop of trees from rising; while the others recommended, will keep erect, in the severest gales. If larches are attempted to be planted in such situations, they should be in large masses.

tions. The principals are supposed to be Oak, Elm, Beech, and others, planted in masses.

It is very obvious, that it would be improper to plant, in such situations as above alluded to, a small corner, or a narrow stripe. The plants in such a case would probably never rise to timber. Plantations, therefore, near to the sea, whether on flat or elevated ground, should be very considerably extended ; they should consist of many acres ; and if of hundreds of acres, so much the better.

On the banks of a circular bay, including several small promontories or peninsulas, the land at the same time being somewhat bold, and the soil of a quality not to be called bad, a plantation may be reared with more success, than where the coast is straight or flat. Many such bays are to be found on the coasts of the Scots Highlands, and of their *lochs* or larger inlets of the sea, where the property might be much enhanced in value by being planted.

II. *Of Groves.*

As already observed, a *grove* plantation differs from a *forest* plantation, only with respect to extent. The situation for a grove, therefore, may properly enough be such as any of those noticed above, excepting the top of a bleak hill, or the exposed coast of the open sea. A small grove,

however, should never be attempted on an exposed open plain. In such a situation, a mass of less than four or five acres, unless the soil be uncommonly good, will seldom be found worth the trouble of planting and properly fencing.

On the base of a mountain, the hang of a hill, the banks of a river or other stream, a grove appears to great advantage, provided its extent bear some proportion to the objects around. Indeed, a small corner, or patch, can never please in the character of a grove, (which implies a plantation of tall-stemmed trees); because, as the plants shoot up, the lower part will naturally become open, and so make an insignificant appearance. In such a case, a wood or copse is certainly much more in character.

But groves are most generally planted in the environs of a mansion-house, in parks, and ornamental grounds; and they often form the chief artificial features of a place. Here, indeed, if the place be extensive, they are most in character; and, if contrasted with woods, copses, and thickets, produce great interest. But in such cases, a grove should never be, or at least appear to be, diminutive. Its situation should always be such, as to exhibit the greatest possible magnitude, when grown up, as well as in its infancy. That the grove may appear to most advantage, it is necessary that it occupy the hang of a hill, or the swell of a rising ground: thus situated, it

shows a greatly enlarged canopy of foliage. When placed on level ground, the grove necessarily requires to be more extended in length and in breadth, to produce the same good effects*.

We do not wish that our observations respecting grove plantations, should be understood as affecting those clumps, small patches of planting, or groups of trees that are merely intended to beautify the park or the lawn. Were such clumps planted for any other purpose, we doubtless would consider them as very improper appendages: but when properly pruned and thinned, they are very ornamental. The trees in such clumps, however, should never be pruned up in imitation of grove trees, but should be feathered from the bottom upwards.

* In an ornamental point of view, when the subject is a perfect level, there is a very good method of imitating a bank, or hang, by the management of the wood; namely, by planting tall growing shrubs in the front, low growing trees in the middle, and the tallest growing trees behind. A grove situated on a level, although entirely consisting of tall growing trees, if not too old, may in some measure be reduced to this order by judicious lopping or pruning; at the same time, perhaps, planting in front of it a certain breadth of shrubbery.

SECTION III.**ON SITUATIONS FOR WOODS AND COPPICES.**

I. *Of Woods.*

It may be proper here to remind the reader of the difference between a *wood* and a *plantation*. A wood, then, is always understood to be either entirely a natural production; or to be sown, not planted; and to consist of a mixture of timber trees, chiefly of oak and ash, with underwood or shrubs, as willow, hazel, holly, birch, or thorn. Some natural woods, however, particularly in Scotland, consist almost entirely of fir-trees, with, sometimes, a mixture of birch, mountain-ash, and several kinds of shrubs. The extent of a wood may be any thing, from five acres to many square miles: when of this last size, it assumes the appearance of a forest, and generally receives that denomination.

Nature, in establishing most of her woods, seems to have chosen to begin in sheltered situations,—

by the sides of rivers and brooks,—in hollows among crags and rocks,—on sloping banks, or at the bottom of a hill or mountain; whence, from small beginnings, she has often extended her self-sown woods over a variety of country, into magnificent forests.

Hence for rearing woods, we have a variety of examples, and a choice of situation, set before us. One rule we must invariably adhere to; namely, to *sow*, and not to *plant*. All the woods of nature are raised from the seeds, sown on the spot where the trees grow; and we are certain that her timber-trees are never inferior, but often superior to such as have been planted by the hand of man.

It is an opinion very generally entertained, that planted timber can never, in any case, be equal in durability and value, to that which is sown. We certainly feel ourselves inclined to support this opinion, although we readily admit, that the matter has not been so fully established, from experiment, as to amount to positive proof. But although we have not met with decided evidence, to enable us to determine on the comparative excellence of timber raised from seeds, without being replanted, over such as have been raised from replanted trees, we are left in no doubt as to the preference, in respect of growth, of those trees which are sown, over such as are planted.

When trees are removed from the seed-bed, whatever care be employed, the tap-roots, with many of the lateral roots and fibres, are unavoidably injured, and often greatly curtailed : subsequent removals, certainly do not tend to lessen this evil. Many who have the direction of the removal and replanting of seedling forest-trees, seem not satisfied with these accidental diminutions of the original roots ; but cut them still farther in, and sometimes so unmercifully, that they never do more good *. That intelligent Nobleman, and successful planter, the EARL of HADDINGTON, who had made planting his particular study, says, “ If I
 “ could raise all my trees from the seed, without
 “ any removing, it would be the best way ; but I
 “ have given reasons why it cannot be done. In
 “ all the authors I have read, there is one positive
 “ order that I never follow, viz. the cutting off
 “ the tap-root or the carrot root of the oak.”
 We consider a tree having its original roots thus abridged, as advancing pretty nearly in its nature to a cutting, or layer, which it is well known seldom attains to the size of a tree of the same kind

* Mr Knight, that intelligent student of vegetable nature, has noticed the necessity of preserving the *whole* roots of apple plants when removed from the nursery to the field : He says, “ But in removing from the nursery to the orchard, attention should be paid to leave the roots as long and as little injured as possible.” See his excellent Treatise on the Apple and Pear.

raised from seed. In short we hold that the entire preservation of the perpendicular or tap root, projected from every seed by nature, with all its fibres, is the surest and most effectual means of obtaining the great object in view, namely, perfect timber; and that every abridgment occasioned by the subsequent removal of the plants, must derange the flow of the juices. Hence the want of success generally attendant on the replanting of large trees. Indeed the younger that trees can be removed, and planted in the field for good, so much the more will the progress of their growth be accelerated, as has been well ascertained by experience. For these and like reasons, we give the plan of raising woods, forests, and copses, from seeds sown where they are to remain, a decided preference.

The Oak is a tree very slow in growth, if planted in a bleak situation and a poor soil; but if planted in a favourable situation and good soil, it rises fast, keeping pace with many other kinds of trees. In projecting an oak wood, therefore, it would be improper to sow in an exposed situation and barren soil, without using some means to shelter the rising plants. M. DE BUFFON says, "The ground which is covered, or rather half covered, with junipers and heath, is already a wood half made." When such natural shelter is wanting, it may be effectually supplied by planting nurse plants of other kinds; but this will be

fully treated of in the sequel. In the rearing of woods, however, in better situations, such as the waste corner of a sheltered estate, or a farm in an arable district, or in a park for ornament, an oak wood, properly so called, may be raised from acorns without any nurses. In the former case, the wood partakes of the character of a grove for a number of years, namely, until the nurse plants be removed.

A very advisable and fit situation for an oak wood, may be found on the banks of a navigable river; or the banks of any considerable stream, passing through a broken surface of craggy or rocky ground, where the soil consists of loam, gravel, and decomposed rock. In such a situation, the oak becomes most valuable; and, according to the different circumstances of soil, the Ash, and some of the other kinds, might be interspersed; which will be farther noticed in the next section. The vicinage of a navigable canal, also, where the situation and soil are favourable, is a place very proper for the raising of an oak wood.

There are likewise many situations, altogether inland, which are very fit for the same purpose. Indeed, it is hard to say in what part of the country it would not be advisable to attempt an oak wood, if the circumstances of soil and local situation be favourable, since the tree in the

various stages of its growth, is so universally useful.

II. *Of Coppices.*

A natural copse, with respect to its origin, and the kinds of plants, (excepting resinous trees), differs in nothing from a wood, as above defined. A copse is never allowed to rise to timber of any considerable size; but is always cut down for fuel, stakes, poles, the bark, &c. When the timber-growing kinds are allowed to remain untouched, and are trained up to trees, it is then changed into a wood. The situation of a natural copse, of course, is generally such as that of a wood,—of which, in truth, it is the prototype, and would, if left to nature, soon become one; but it is kept in a state of copse by man, often from his necessities, and sometimes from his choice.

Coppes are often planted, or, more properly, sown with the intention of keeping them merely as such, and to answer various useful purposes; as the production of stakes, rails, poles, hoops, charcoal, fuel, or bark. They are also frequently reared in parks and grounds as objects of ornament, or as covers for game. Hence, artificial coppes are frequently to be found in very favourable situations and soils; and in such their products are exceeding profitable.

The extent of a copse, may be any thing from half an acre and upwards ; but there is no species of plantation so well adapted to fill up, or occupy small corners, or broken spots in arable fields, occasioned by the operations of mining or quarrying, or to cover the broken rugged banks of a stream or river. In parks, they appear to great advantage, when judiciously placed, and contrasted with woods and groves.

SECTION IV.

ON THE SOILS BEST ADAPTED FOR THE DIFFERENT KINDS OF FOREST TREES.

PREVIOUSLY to considering the soils best adapted to particular trees, a few general remarks seem proper.

Although no tree will flourish in a superlative degree, except in what may be termed *its own soil*; yet many trees of the same kind are to be found in tolerable perfection, in soils of apparently different qualities.

In favourable situations, although the surface may appear poor and thin, we should not despair of rearing some kinds of tree to perfection; as in such cases, the under-soil is often found of good quality, and able to produce valuable timber.

The most unfavourable of any soil, for the production of timber, is a cold, shallow, irony till, incumbent on a clay subsoil, which upholds a poisonous ochry water, that either stagnates on the surface of the clay, or lodges in that part of the soil which is the pasture of the roots.

The following, in most cases, are the soils and their substrata, on which it is deemed proper to plant for the production of timber.—Sandy, or gravelly soils, incumbent on rubble, or loose sandstone.—Loamy soils, on a gravelly or porous subsoil.—Sandy, gravelly, or loamy soils, on a clay or retentive subsoil.—Chalky loam, or flinty chalk, on a porous, or a rocky substratum.—Loamy clay, on sandstone, or on limestone rock.—Clay on the same.—A mixture of loam and argillaceous schistus, on basalt or whinstone rock.—Free, loamy soils, on granite rock.—Strong loamy or clayey soils on iron ore or on blue till.—Thin, heathy, or moorish soils, incumbent on rubble ;—and the same incumbent on clay, or on till*.

THE ALDER.

Although the alder is found in the highest perfection, in moist soils, and even in standing water, yet it will grow freely in light, elevated lands, where, however, its tendency is to impoverish the soil, being only satisfied with a superabundance of moisture. In calcareous and chalky soils it speedily languishes. The alder is found growing naturally by the sides of the most rapid rivers and

* The nomenclature of soils, we may remark, is extremely uncertain. We have employed the most popular and obvious phraseology, without attempting any new or more correct language.

streams ; and perhaps no tree is equally well adapted to the upholding of their banks, from the multiplicity of its roots, and their peculiar disposition to seek continually along the edges of the water-courses in quest of their natural food.

THE ASH.

This tree is found in the highest perfection, on dry, loamy soils : On such it spontaneously grows : In moist, but not wet soils, it grows fast, but soon sickens. It will grow freely on most kinds of soils if the situation be tolerably good, excepting on retentive clays or tills. In wet soils, it soon *sits up**, languishes, and dies. In rich-lands, its wood is short and brittle ; in sandy soils, it is tough and reedy, qualities which, for several purposes, very much enhance its value. In loam, mixed with decomposed rock, at the bottom of a mountain, (as at Alva in Stirlingshire, and Ochertyre in Perthshire), the ash arrives at a great size.

THE MOUNTAIN-ASH.

This plant is found in so many different soils and situations, growing naturally, that one might

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* A gardener's phrase, which implies, that, while the tree still continues alive, it ceases to increase, either in girth or in height.

almost say any soil is adapted to it. It certainly, however, becomes most useful and valuable in sandy soils.

THE BEECH

Is found in highest perfection in sandy loams. It also flourishes remarkably on all calcareous soils, and indeed naturally grows on such. Even on clayey soils, lying on a retentive, tilly, wet substratum, (as in the avenues at Panmure, Forfarshire), it becomes a graceful tree of great magnitude. Among rocks, crags, &c. where there is little or no soil to be seen, the beech arrives at a great size. In low situations, by the banks of rivers, (as at Newbottle*, Edinburghshire), and by the sides of rapid streams, at the foot of mountains, (as at Arkindglass, Argyleshire), this tree has sometimes grown to a vast and very uncommon size †.

* One tree, in particular, at this ancient seat, was lately blown down by a heavy gale of wind. It contained upwards of one thousand measurable feet of timber, (20 loads, or 25 tons), and is reasonably supposed to have been one of the largest beeches that ever grew in Scotland. Dr Walker, late Professor of Natural History at Edinburgh, in his Essays, mentions, that, on the 6th of July 1789, the trunk of this beech, where thickest, was seventeen feet in girth; and that the span of the branches was then eighty-nine feet. He thinks that it must have been planted between 1540 and 1560.

† In the deer park at Panmure, a little below the old castle, there now grow (1811) two very large and handsome

THE BIRCH.

The Birch, like the mountain-ash, is found growing naturally, in almost every kind of soil, from that of a deep, moist loam, in a low bottom, to a

beeches;—the girth of the one, at three feet above the surface of the ground, is 11 feet 9 inches, with a stem of 32 feet;—the girth of the other, at the same height, is 10 feet 6 inches, with a stem 51 feet long;—both are quite straight and clean. The extreme height of these superb trees, is, by estimation, 90 feet. In another part of the grounds of Panmure, there is a beech tree 26 feet 6 inches in circumference at the surface of the ground, and, at 2 feet high, 20 feet. Its stem divides, at the height of 9 feet, into a very large head. The Ardkindglass beech, above alluded to, is as large as this, with a much better stem, and finer head. Excepting at Castle-Howard, in Yorkshire, (where are certainly the finest), and at Woburn, in Bedfordshire, we have seen no beeches to be compared with these. The *Spanish* beech, in the Ray Wood at Castle-Howard, (so called by Lord Carlisle from its resemblance to huge beeches in Spain), is in girth, at 3 feet high, 15 feet 2 inches;—stem 35;—total height, by estimate, 90 feet. The largest Woburn beech, at the same height, measures 11 feet 3 inches in girth;—stem 50 feet;—total height, by estimate, 80 feet. These trees were both measured in summer 1810. The beeches in the deer park at Panmure grow in alluvial soil, being the deposition of a winding rivulet, and consisting of a mixture of loam and gravel. The Ray Wood beech at Castle-Howard grows on a loamy, elevated knoll; the Woburn beech on the hang of a sandy or gravelly knoll. All the above trees seem in good health; and it is impossible to guess at what size they may arrive.

poor, sandy, gravelly or moorish earth, on the sides of the Grampian mountains.

It is found to luxuriate most in deep loams, lying on a porous subsoil, or in alluvial soil, by the sides of rivers or smaller streams. Even in such situations, though among stones and rocks, as on the river Dee, Aberdeenshire, in particular, the Birch flourishes most exuberantly. On the sides of hills, in dry soils, it grows slowly ; but on such, its timber is most durable.

THE CHERRY. (*Wild Gean.*)

The cherry may, properly enough, be reckoned a forest tree ; it is often found growing naturally, both in our woods and groves, and is likewise often planted. It thrives best in a sandy loam, in low ground, or on sloping banks ; and in such situations becomes most valuable. In cold damp soils it grows very slowly, and soon sickens. It grows freely on rich soils ; but in such its wood is too soft, and too light coloured, for the purposes to which it is otherwise most applicable.

THE CHESNUT. (*Spanish Chesnut*).

This noble tree thrives in many different kinds of soils ; but, like the beech, it luxuriates most in deep sandy loams. It does not thrive in wet, or over stiff land ; though it will grow freely enough

in a soft clay, lying on sandstone rock. In sandy soil, elevated but a little above the surface of the water, (as on the Island of Monteith, Perthshire); in loamy soils, at the bottom of a mountain, (as at Alva, Stirlingshire); in loam incumbent on clay, (as at Brechin Castle in Forfarshire, and at Gargunnock, Stirlingshire); and in gravelly or alluvial soil, near to a river, (as at Finhaven, Forfarshire); and, even in the cold, tilly, exposed grounds of Lochgilly in Fifeshire, where it keeps pace with the beech, the Chesnut grows to a very great size *. Some consider the chesnut as a native of England; but this is doubtful; and it is certainly not indigenous to Scotland.

THE ELM. (*Rough-leaved, broad-leaved, or Scots.*)

This tree accommodates itself, both in a natural state and when planted, to many different soils

* At Monteith, Alva, Brechin-Castle, Gargunnock, Breadalbin, Castle Menzies, and Lauers, the Chesnut has arrived at an uncommon size; and very fine specimens are just now to be seen at those places. Indeed, wherever the chesnut is planted in its proper soil and situation, it will outgrow any other timber tree in the same length of time, excepting, perhaps, the larch, the willow and some of the poplars. At Finhaven, a vast and aged chesnut was blown down a good many years ago, being much decayed: The greatest circumference of its trunk was 45 feet: its head was very large and spreading. In the possession of George Skene, Esq. of Skene and Carristone,

and situations. The soil in which it most luxuriates, is a deep rich loam ; but that in which it becomes most valuable, is a sandy loam, lying on rubble, or on dry rock. It is frequently found flourishing by the sides of rivers or streams, which sometimes wash part of its roots ; yet it will not endure stagnant moisture. In wet tilly clays, as at Panmure, it soon sickens. On bleak hills, among rocks, and where soil is hardly perceptible, it will often find pasture, and arrive at a considerable size. In a mixture of loam and clay schistus, incumbent on whinstone rock, as at Alva, it arrives at a very large size within a century*.

THE LABURNUM (*the tree sort.*)

This is a also hardy tree, a native of Switzerland and Savoy, and grows freely in exposed places, where the soil is but indifferent. It becomes most valuable in ligh loams, or sandy soils. It

there is a table made of the wood of the tree, having an engraved plate, on which are marked its dimensions. It was long accounted the largest tree in Scotland ; and the late Dr Walker estimated its age at 500 years.

* This kind is supposed by Evelyn to be the *Alim* of the ancients. Mr Miller calls it " the Witch Elm ;" Mr Marshall " the Coarse-leaved Elm, the Wych Elm, or the North-country Elm." In Scotland it is the most common kind, and is universally called the Scots Elm. The boughs spread wider, and hang more down than those of the English Elm, and the leaves and seeds are much larger.

will grow most rapidly in deep, subhumid, or loamy earth ; but in such, if much exposed to the wind, it is very apt to lean over to one side, outgrowing, as it were, its own strength.

THE HORNBEAM.

The Hornbeam is a hardy forest tree, and is to be found thriving in many bleak situations, and in a variety of soils, both where it has grown naturally, and where it has been planted. In better situations, and in loamy soils (as at Alva, Stirlingshire, at Keith-hall, Aberdeenshire, at St Mary's Isle, Kirkcudbrightshire), it becomes a very large tree. It has, however, been rather neglected as a forest tree *.

THE LARCH.

The Larch is a native of the Swiss and Italian Alps. Its introduction into this country has been

* One special reason why the Hornbeam has been less planted in forests than it naturally deserved to be, is, that the English nurserymen long ago raised great numbers of them from *layers*, purposely for hedges, which answered that design very well. But plants of this kind, raised from layers, never arrive at great stature as timber trees ; and the English plants being generally spread abroad, the hornbeam came to be considered more as a shrub than a forest tree. But, since the time Mr Miller wrote, it has been more raised from seeds, and is now more generally used as a forest tree.

a most fortunate circumstance *. When we consider its general usefulness, the facility with which it may be propagated, and that it will not only grow, but speedily reach a large size, in almost any soil or situation ; we cannot but with feelings of gratitude, think on the Noble Duke † who, about half a century ago, first planted it on the Grampians ! The larch may now be considered as naturalized in Scotland, being planted universally, and found to grow to perfection, as far as can yet be seen ‡, on hill, dale and mountain ;

* The following anecdote concerning the introduction of the Larch into Scotland, is related by Dr Walker. Some larches “ were sent down from London by the then Duke of Athol, in the year 1727, along with orange trees and other “ greenhouse plants.” They were kept with these for two or three years in pots, in a greenhouse, as rare exotic trees ; but, when their hardy nature came to be known, they were planted out in the garden. One or two of these original larches still remain at Dunkeld House, in the state of lofty trees.

† The late DUKE of ATHOL.

‡ Some instances have occurred during spring, 1812, rather unfavourable in regard to the perfection of the larch in all soils and situations. On the very rich banks and warm situation, on the home grounds of the estate of Raith in Fifeshire, the larch has increased to a great size in a short period ; but, in nearly a thousand instances, there was hardly a single exception, where the hearts of these were not even beginning to rot ; while larches of the same age, which had been planted on the same estate, in apparently less favourable soils and climates, which had not grown so rapidly, were as sound and firm in the heart as could be desired.

At

in loam, in clay, in gravel; in peat earth, in moor earth, among rocks and stones; in short, every where, except in standing water. At Dunkeld, Blair, Monzie and Gartmore, in Perthshire; at Alva, in Stirlingshire; at Panmure and Brechin Castle, in Forfarshire; and in the wood at Culloden *, Inverness-shire; are to

At Lesslie, in the same county, there were cut at the same time a number of large larches, many of which were quite hollow. These stood in low sheltered rich land.

Also at the same time, larches cut from Mr Oswald's Den, near Kirkcaldy, in Fife, exhibited the same symptoms of decay. The soil and situation of this Den is similar to the home grounds of Raith above mentioned.

These instances would appear to say, that the soil and climate for producing the larch timber to the greatest perfection, is not that in which the plants make the most rapid progress. It further appears, that a certain elevation of situation, and inferiority of soil, is necessary to the producing of this timber in perfection. Trees that make very rapid progress in growth are necessarily soft in their texture, from the dilatation of their pores, by the superabundance of juices carried into them; hence the fibre of the wood becomes very liable to corruption. Is this the reason of the early decay of the larch in the above instances?

* At Culloden there is, or lately was, a solitary larch, of a very fine stem, and great height. It stands, or stood, in a hollow by the side of a small rill, in a fir-plantation above the house, and in the west end of the moor on which the battle of 1746 was fought. This fir-plantation was about 10 feet high at the time of the battle, according to the information given to us by a man who fought in the Prince's army; of course, it must be about 75 years old; but the larch is supposed to have been planted some time after the battle, and does not appear to be much above 60 years old.

be found the largest and finest larches in all the island *.

Of late years, the planters in this country were very much alarmed by the appearance of an insect (*Coccus larixea*) upon the larch, which threatened to be of serious detriment to the trees, and certainly very much retarded the progress of the young plantations. This insect is not new, either to the larch or to several other trees in this country. We knew of it appearing on larches at Raith, in Fifeshire, about the year 1785; but it was not observed to spread, or to do any particular harm. It was not till 1801 or 1802 that its ravages were much extended; it having been greatly encouraged by the circumstance of three dry seasons succeeding each other. The insect, however, is *now* much less prevalent; it seems to dirty, more than materially injure the tree, and is now thought lightly of. In the past season, 1811, these insects have not been so numerous as in 1810; and they have disappeared sooner, probably owing to the excessive dampness of the spring and autumn; circumstances which may tend very much to diminish their numbers, and hinder their progress in succeeding years. The Larch is less valued on account of its tendency to warp, after being sawn

* The boasted larches at Stow in Buckinghamshire, at Hagley, and at Enville in Shropshire, bear no comparison with those at Dunkeld, Blair and Monzie, in North Britain.

into board or joisting. Some curious instances of the absence of this tendency has occurred lately in the experience of the writer. In an extensive den, planted about forty-eight years ago, on the estate of Pitfirren in Fifeshire, where the larches have been nursed by Scots fir, there is no tendency to warp when sawn up; the trees, however, exhibit the same disposition to decay in the hearts for several feet upwards. The trees are generally 3 feet 6 inches in girth.

The part of the plantation now mentioned is on a north-east exposure, evidently the most proper for the growth of this fine timber. The absence of the tendency to warp, is attributed to protection afforded by the nurses and situation from the high winds.

THE OAK.

The Oak is a native both of England and Scotland. The extensive and general usefulness of the timber is probably the cause of its being planted in a greater variety of soils than most other trees. It luckily happens that it will grow, and even become timber of considerable size, on soils of very opposite natures. It thrives best, however, in strong deep loam, incumbent on gravel or dry rock; but in all soils in which there is any considerable proportion of loam, it will thrive in a greater or less degree. In low situations, where the soil is deep and moist, it grows rapidly, and attains to a

great size ; but, in such places, it is found to decay sooner than it does in a more elevated situation, with a drier soil. In light soils of little depth, although it grows slowly, it becomes firm in texture ; and the timber, though smaller in size, acquires a state of maturity sooner than that grown on more cool and retentive soils. In deep, cool sand, it will root firmly, and arrive at a great size. In clay, incumbent on till, to which all other trees, excepting the beech and the sycamore, have an aversion, the Oak will grow and produce useful timber.

Comparatively speaking, there are now no *large* oak trees in Scotland, though there have formerly been very many. The recent scarcity and high price of oak timber, and the uncommonly high prices given for the bark, have very much tended to lessen the numbers of full grown trees. The largest and finest oak trees in Scotland are to be found at Dunkeld, Alva, Buchanan, Inverary, Hamilton, Melville Castle, and Dalkeith ; but they cannot once be compared with those of Castle Howard, Welbeck*, and Dunhammassey, in England.

* We shall here note the dimensions of several oaks at Welbeck as stated in a pamphlet, with drawings of the trees, by Hayman Rooke, Esq. F. S. A

The Green Dale Oak is said to be 700 years old. Girth of the trunk above arch, 35 feet ; height of the arch, 10 feet 3 inches ; width of ditto, 6 feet 3 inches ; and height of the tree, to the top of the live stump, 54 feet.

THE SYCAMORE. (*Plane-tree in Scotland.*)

This tree is generally considered as a native of Britain. It will grow, and even become timber, in any kind of soil from a light sand to a tilly clay. It dislikes much wetness, and will not thrive long in stagnant water. In sandy or light loams, it thrives best, and becomes most valuable. In loam mixed with clay-schistus on whinstone rock, (as at Alva), it becomes a very large tree within a

The Porters are two very large trees, and are so called from the circumstance of there formerly having been a gate placed between them. No. 1. measures, in circumference, at the ground, 38 feet ; at a yard high, 27 feet ; at 2 yards, 23 feet ; total height, 98 feet 6 inches ; and solidity, 848 feet ! No. 2. in girth, at the surface, 34 feet ; at 1 yard high, 23 feet ; at 2 yards, 20 feet ; height 88 feet ; and solidity, 744 feet.

The Duke's Walking Stick, in girth, at the ground, 21 feet ; at one yard high, 14 feet ; stem 70 feet 6 inches ; total height, 111 feet ; and solidity, 440 feet.

The Oak and Ash. Girth of both at the ground, 36 feet ; of the oak, at one yard high, 18 feet ; at two yards, 15 feet 4 inches ; and height 92 feet. The ash is comparatively very small. It leaves the oak at a small distance above the ground, and unites again at eight or nine feet high ; then branches out, and towers along with it for some thirty or forty feet. Taken together, they form a very various and uncommon picture.

Of the famous Scots oak in the Torwood near Stirling, generally called Wallace's Oak, no trace now remains. Dr Walker mentions an oak, at Loch Arkeg in Lochaber, which measured 24 feet 6 inches, at the height of four feet from the ground.

century. On colder, stiffer soils, (as at Panmure, Forfarshire, and at Arniston, Edinburghshire), it grows slowly, but arrives at a good size. On the banks of a river, in a loamy soil, incumbent on rock, (as at Kippenross, Perthshire), it attains to a very great size*. On rotten rock, and in an exceedingly exposed situation, (as at Prior-Letham in Fifeshire); it grows, as a single tree, to a very large size†. It outlives the Ash in elevated situations, as at Castle Campbell, near Dollar, and becomes very large timber, in alluvial soil of a sandy nature, as at Castle Menzies in Perthshire, and at Aberdeen, on the Earl of Morton's grounds, Fifeshire.

* The Plane-tree (sycamore) of Kippenross, belonging to John Stirling, Esq. is truly a noble tree; and Nattes, in his "*Scotia depicta*," has given a representation of it. He states it to have been, in 1801, 28 feet 9 inches in girth, with a stem of 30 feet. He must have measured its circumference at the ground, as at breast height in 1798, its girth was only 22 feet 6 inches. In 1809, this tree was in full health and beauty. Its head is very large and spreading.—There are also some very fine Sycamores at Newbottle in Mid-Lothian.

† The Prior-Letham Plane measures in circumference, at the surface of the ground, 24 feet 8 inches, and at the parting of the branches, 19 feet. The stem is 12 feet high. The top divides into 10 large limbs; but what renders this tree very remarkable is, that it stands by itself in a cold, flat, exposed country, at a considerable distance from any other tree. There is another circumstance which, perhaps, entitles it to notice; namely, it was one of the two trees discovered in Scotland by Dr Johnson, on his memorable Northern Tour.

THE SCOTS FIR.

This tree is naturally the inhabitant of mountainous districts, and of rocky, gravelly, or poor sandy soils, where its timber becomes most valuable and durable. On the sides of mountains, in dells and hollows, among stones and rocks, beside rapid rivulets or mountain torrents, it is found in high perfection ; and if it stand single, it is of great beauty. In many parts of the Scots Highlands, where the soils are extremely various, and much mixed, the Scots Fir has arrived at a good size, and often attained remarkable dimensions. In any kind of soil from a sand to a clay, provided the substratum be rubble or rock, it will grow and flourish ; but in wet, tilly soils, it ought never to be planted ; because whenever the roots have exhausted the turf or upper soil, and begin to perforate the subsoil, the tree languishes and dies*.

* There have been several varieties of the Scots Fir, distinguished by modern botanists. The sort which is most commonly cultivated is least worth the trouble. The *Pinus sylvestris* var. *montana*, is the variety which yields the red wood : even young trees of this sort are said to become red in their wood, and full of resin very soon. The late distinguished Mr Don of Forfar exhibited specimens of cones of each variety to the Highland Society of Scotland, and likewise to the Caledonian Horticultural Society, (*Memoirs*, vol. ii. p. 121. *et seq.*). It is much to be wished that his researches were followed out in this important matter. We understand that the variety preferred by Mr Don is distinguished by the disposition of its branch-

THE SILVER-FIR.

This tree is also found to thrive on very opposite soils. In loamy soil and an elevated situation, (as at Castle Howard); on a sandy or gravelly hill, (as at Woburn); and in clayey soil, incumbent on till, and a high situation, (as at Pan-

es, which are remarkable for their horizontal direction, and for a tendency to bend downwards, close by the trunk. The leaves are broader and shorter than in the common kind, and are distinguishable at a distance by their much lighter and beautiful glaucous appearance. The bark of the trunk is smoother than in the common kind. The cones are thicker, and not so much pointed. This variety Mr Don considers as more hardy than the common sort, observing that it grows freely in almost any soil or situation, and quickly arrives at a considerable size.

The existence of the red wooded variety of the Scots fir was long ago noticed. The noble and learned Earl of Haddington, when writing to his grandson on the important subject of raising timber, says, " Though I have heard it asserted that there
" is but one kind of Scots fir, and what difference is seen in
" the wood when wrought is only owing to the age of the tree,
" and the soil where it grew; yet I am convinced it is other-
" wise, for this reason: When I cut firs that were too near the
" house, there were people alive here who remembered when
" my father bought the seed. It was all sown together in the
" seed-bed, removed to a nursery, and afterwards planted out
" the same day. These trees I cut down, and saw some of
" them very white and spongy, others of them red and hard,
" though standing within a few yards of one another. This
" makes me gather my cones from the trees that have the red-
" dest wood, as I said before."

mure), the Silver-fir has arrived at a very large size*. It is a hardy tree, being a native of Switzerland and the high parts of Germany; and in all free soils it grows apace, and becomes very valuable timber. Until of late years, however, the Silver-fir has not generally been planted for the value of its timber, but for its worth as an ornamental tree. Yet there is perhaps none of the Fir

• The largest Silver-fir at Panmure, measured, in September 1810, at the surface of the earth, 8 feet 4 inches; at four feet high, 7 feet 1 inch; length of the stem to the fork, 41 feet; total height, 80 feet. Several others in the same place are nearly as large. One has a thicker but shorter stem.

In the Ray Wood at Castle-Howard, there is a Silver-fir, in girth, at four feet high, 11 feet 6 inches, with a stem 80 feet high; total height, by estimate, 100 feet. Some others in the same wood are nearly as large. The *Grand Silver-fir* (as it is called) at Woburn, is in girth, at the same height, 9 feet 10 inches, with a stem of 75 feet; total height, by estimate, 110 feet. Both these trees were measured in summer 1810. These trees are evidently much older than those at Panmure; which seem equally vigorous and healthy, though less drawn up by the proximity of other trees.

At Newhall in Haddingtonshire, there stands a solitary Silver-fir, in girth, at the surface of the earth, 9 feet 6 inches, and at four feet high, 8 feet; stem 40 feet; and total height, 60 feet. It grows in strong clay, and seems healthy: but the leading shoot has been injured by the wind: its top is now much divided, and it promises to grow little more to the height.

In Binning Wood, Haddington, there is a Silver-fir, the girth of which at breast high, in July 1812, was 10 feet 4 inches,

tribe more worthy of cultivation for the sake of its timber alone. Even the Larch does not much exceed it in rapidity of growth, and the boards of the silver-fir are not so liable to warp as those of the larch.

THE NORWAY SPRUCE-FIR.

The Spruce, like all other firs, will both grow and thrive in soils of very different qualities. It luxuriates most, however, in deep loams, and low situations, where it has sufficient scope for its roots. In shallow soils, and exposed places, it never succeeds. On acclivities with a north-east aspect, with moist sandy soil, it grows very freely, producing fine timber. In soils of a middling sort, and in situations tolerably well sheltered, its timber becomes very valuable.

THE WALNUT.

This is a tree not often found in the forest, at least in Scotland; yet, considering the size it attains to, and the usefulness and value of its timber, we think it claims the particular attention of planters all over the kingdom. It is originally from Asia; but is hardy and thrives well in all soils in which there is any considerable portion of loam, provided they be dry, and the situation somewhat sheltered. In loam mixed with clay-

schistus, (as at Alva) *, it flourishes remarkably, and arrives at a large size ; in dry, brown loam, on the banks of a natural lake, (as at Otterston, Fifeshire) ; and in clayey loam, on till, (as at Panmure) ; it has reached a good *timber* size within a century. In a deep black loam, (as at Culross Abbey in Perthshire), it has arrived at a great size. At Raith, in Fifeshire, on a high situation, in strong loam incumbent on a whinstone rock, it makes a good tree. The timber produced in such situations, though smaller, is more solid and valuable than that produced in more favourable places, as we lately observed at Hillside in Fifeshire †.

THE WILLOW.

The Willow, of which there are many species, is often found growing *naturally* in forests and woods, and of course it deserves a place here. The Huntingdon willow, and the Bedford willow, are the kinds most worthy of cultivation for timber. The Huntingdon willow is very generally known, but the Bedford willow, so much esteem-

* There stands, or did lately stand, near the house at Alva, the finest and largest Walnut-tree we remember of having seen, either in Scotland or England.

† At Hillside grew a single large Walnut-tree, which was blown down in the spring of 1810 ; when cut up, it was found quite hollow. It grew in very deep loam, but had probably been mismanaged in youth.

ed in England, has been little attended to in Scotland. It grows to a great size, and its timber is useful for many purposes. There are a few large trees of this sort about Edinburgh, particularly at the village of Canonmills. A kind called the Red-twigged Willow may also be mentioned : it forms a large tree, and has a fine silvery foliage : it is probably the same as the Upland Willow of Mr Pontey ; and perhaps may be regarded as merely a variety of the *Salix fragilis*, to be afterwards mentioned *.

The situations most proper for willow trees are such as are low and moist, by the sides of rivers and brooks ; yet most species will thrive in high, and even dry situations and soils. In most soils, if a foot in depth, the willow grows apace, and arrives at a considerable size, according to its nature.

* Several trees of the red-twigged willow were growing in 1811, at Brucefield Nursery, near Dunfermline, Fifeshire, 60 feet high and upwards : They grew as rapidly, and produced as good timber as the Huntingdon. These are now (1819) felled.

SECTION V.

ON THE KINDS OF TREES MOST FIT TO BE CULTIVATED IN FORESTS, GROVES AND WOODS ; IN THE PARK, AND IN HEDGEROWS ; THEIR PROPERTIES AND USES.

WE shall here first exhibit a list of the kinds of trees most fit to be cultivated in the above situations ; and then proceed to detail their appearances, stations, properties, and the general purposes to which their wood, bark or twigs, are applied.

Deciduous Trees.*

The Alder,	The Horse-Chesnut,
The Ash,	The Elm (2 species),
The Mountain-Ash,	The Hawthorn,
The Beech,	The Hornbeam,
The Birch,	The Laburnum,
The Cherry,	The Larch,
The Chesnut,	The Lime,

* The particular order or arrangement of the trees mentioned being of little importance, they chiefly follow in the alphabetical order of their common English names.

The Oak,	The Sycamore,
The Plane (2 species),	The Walnut,
The Poplar, (different species),	The Willow, (different species).

Evergreen Trees.

The Balm of Gilead Fir,	The Pinaster,
The Silver Fir,	The Scots Pine or Fir,
The American Spruce	The Weymouth Pine,
Fir (3 species,)	The Cedar of Lebanon,
The Common, or Nor-	The Holly,
way, Spruce Fir,	The Yew *.

* In this list, there are several kinds of trees which have not been noticed in the preceding section on *Soils*; and it may be proper here, for the information of some readers, to remark, that the Horse-Chesnut and the Hawthorn will thrive well in all loamy soils, and moderately sheltered situations. In treating of the last named as a hedge-plant, however, this matter will be more particularly noticed in the Kalendar.

The Lime is a free-growing tree in almost any soil or situation where it may with propriety be planted. It is fit only for situations near a residence.

The Plane thrives best in light loams which are moist, but not wet. It will grow freely, however, in drier and in poor soils. Like the lime, it is fit only for the grounds near a residence. The American Plane thrives better in a moist soil than the Eastern Plane, and will even endure partial inundations.

The Poplar will thrive in the soils specified in the preceding section as being fit for the willow.

The Balm of Gilead Fir will thrive wherever the Silver-fir flourishes.

The

THE ALDER, *Oller*, or *Aller*.*(Betula alnus.)*

This is a middle-sized tree. If allowed to take its natural form, it may be termed rather a handsome tree than otherwise. Its leaves are of a fine dark green ; and it retains them late in the season ; so that in autumn, it forms a striking contrast with many other deciduous trees. It cannot, however, be reckoned among ornamental trees, unless it be employed for the purpose of concealing a marsh, stagnant pool, or the like, in a park or in dressed grounds. Its great usefulness, by the sides of rivers and rapid streams, has been noticed in the preceding section. Alder wood is used by the turners and patten-makers ; also for flooring, and for roofing of sheds and outhouses ; for the

The American Spruce thrives best in moist, loamy soils, and sheltered situations ; yet it will grow freely in lighter and drier soils, if moderately well sheltered.

The Pinaster is equally hardy with the Scots fir ; in maritime situations perhaps more so.

The Weymouth Pine and the Cedar of Lebanon, grow freely on all lightish soils of a moderate depth ; but best in deep sandy loams. Neither of them is suited for the northern parts of our island, especially in very exposed situations.

The Holly and the Yew are both hardy trees : and are found growing naturally in high, bleak, as well as in low, sheltered, shaded situations ; in a variety of soils, from a light sand to a strong clay.

cleathing or lining of carts, and the like. It makes durable posts for gates; and as it endures water long without injury, it makes lasting props in coal and iron mines, and has been much planted of late for these purposes. Charcoal of it is much used in the manufacture of gunpowder. The larger branches are charred for the coarser sorts, while the smaller ones are used for the finer sorts. The bark of the Alder affords a strong tan, and is now much employed, along with the barks of oak and birch, in the tanning of leather. It is well known also in the Scots Highlands, as a dye for some of the colours used in the manufacture of *tartan*, and other stuffs worn in that country.

THE ASH.

(*Fraxinus excelsior.*)

The Ash is a free growing tree, and, when in perfection, is of great magnitude. It is too well known to require minute description. The most proper station for the Ash, is certainly in the forest or the grove; but it is of that figure that it may be admitted as a single tree in the park or the lawn.

Much, however, has been said against admitting the common Ash as an ornamental tree. One discards it, because it does not leaf till late in the spring; but, for the same reason, the oak and the platanus might also be rejected. Another denies

it admission, because it sheds its leaves early in autumn; but the same objection would apply to the beech, the cherry, and the sycamore. A third denounces it, because its foliage is thin, and its branches bare and ugly. Thus the Ash, the most useful and accommodating of trees, is often denied a place where, we hesitate not to say, it might appear with the utmost propriety; and the real reason perhaps is merely that it is common.

It may be remarked, that some of the very arguments adduced against the admission of the Ash into ornamental situations, are such as a person of taste would use for its introduction; because the more dissimilar the Ash is to its neighbouring trees, the greater the contrast and variety, and, of course, the power of pleasing.

Surely the stately height and bulk of a full-grown Ash, in its native soil, clothed with a lively green foliage, elegantly pinnated, plead its cause in too eloquent a manner to be resisted. The roots of the Ash, no doubt, impoverish the soil they occupy; but so do the roots of all other trees, in a greater or less degree. The quantity of heavy leaves annually shed by the Ash, and, consequently, the return of vegetable matter to the soil, may perhaps place it at least on a level with its less exhausting neighbours.

We presume, then, that the common Ash may be admitted into the society of its brethren, the gold-striped, the silver-striped, the weeping, the

entire-leaved and the curled, or its congener the Flowering-ash, in the park and in the lawn, without deviating from the propriety dictated by a just taste *.

The Ash is also much cried down as a hedge-row tree. Next to the oak and Scots elm, however, it becomes the most valuable in that character ; and, until the planting of hedge-row timber be prevented (by statute), we can see no good reason why the Ash should be excluded. It is the total want of training hedge-row timber in Scotland, (for fear, perhaps, of producing the horribly mangled and ugly poles to be seen all over England), which has brought hedge-rows into disrepute, more than any thing else.—But this subject we shall have occasion to notice more fully afterwards.

* If, however, the park or lawn be intended for the pasture of milch cows, for the making of butter, ash trees ought to be excluded. Cows eat the new-fallen leaves greedily ; and these greatly affect the butter. Mr MILLER says,—“ Nor should
“ any ash trees be permitted to grow near pasture grounds,
“ for if any of the cows eat of the leaves or shoots of the ash,
“ the butter which is made of their milk will be rank, or of
“ little or no value ; which is always the quality of the
“ butter which is made about Guilford, Godalmin, and some
“ other parts of Surrey, where there are ash trees growing
“ about all their pastures ; so that it is very rare to meet with
“ any butter in those places which is fit to be eaten : But, in
“ all good dairy counties, they never suffer an ash tree to
“ grow.”

It is hardly necessary to enumerate the qualities of ash-timber, and the uses to which it is applicable. It may be noted, however, that the ash possesses a very singular property, namely, that of being in perfection even in infancy, no other tree becoming useful so soon. A pole, three inches in diameter, is as valuable and durable, for any purpose to which it can be applied, as the timber of the largest tree. The plough and cart wright, the coachmaker and the cooper, are the chief consumers of ash-timber; though, in many parts of the country, it is likewise used for various utensils, and for some articles of furniture. The ash affords, perhaps a greater quantity of potash than any other sort of timber in this country.

THE MOUNTAIN-ASH, or *Roan-tree* of Scotland.

(*Sorbus aucuparia* *.)

This is both a forest and an ornamental tree of middle growth. It shoots freely in almost any situation; and if it stand single, it acquires a fine head. It is an excellent nurse to slow growing trees on bleak situations. If it be planted in a grove, and be properly trained, it attains to a good size. It is a nexcellent coppice plant, growing fast, and being applicable to many purposes.

The timber of this tree has lately been found (owing, no doubt, to the scarcity of other wood)

* *Pyrus aucuparia* of Smith's Fl. Brit.

to be useful for many purposes to which it had not formerly been applied. It has long been used by the turners and wheelwrights. It is now used for flooring, for cart-linings, for herring cask staves, and other purposes. Its poles and shoots are used as hoops. Its bark is employed by the tanner, along with the bark of the oak and birch, to the last of which it is little or nothing inferior. Its berries afford a good dye; and are used, along with the bark of the alder, in dyeing some of the colours for *tartan* and other coarse stuffs made in the Highlands of Scotland.

THE BEECH.

(*Fagus sylvatica.*)

The beech is an elegant tree of the first magnitude; and is universally allowed to be very ornamental. When standing single, it acquires a fine head, and takes a beautiful outline. It is therefore peculiarly adapted to the decoration of the park. As a hedge-row tree, where shelter is an object, it stands unrivalled; where ornament is an object, if properly trained, the same thing might almost be said of it. In the grove, the Beech becomes tall, straight and clean, and of course affords the most valuable timber, as it is required to be straight for every purpose to which it is applied.

Beech is much used in ship-building, for keels and for planking ; in husbandry, for many purposes ; in machinery, mill-work, and the like ; and for the tool-cutter, the cabinet-maker, and turner, it is in universal demand. It makes excellent fuel, whether as faggots or billets ; and is much used for the making of charcoal, and for the smoaking of herrings.

The Purple Beech, is a fine ornamental variety, and even promises to become fit for the decoration of the park, although it has hitherto been chiefly confined to the pleasure ground. A tree of the purple variety in the gardens of Messrs Telfords, within the walls of the city of York, and another in the pleasure ground at Enville, have assumed such tree-like forms, each being fully thirty feet high, that such an expectation may reasonably be entertained ; and the more especially, as we know of several even in Scotland from twenty to thirty feet high. It must however be observed, that the purple beech plants, most proper for the park or the lawn, or indeed for any situation where it is required that they grow to a great size, are such as are *grafted* or budded on the common sort. Those raised by layers, grow more dwarf ; and therefore should be planted in situations where dwarf trees, or bushes, are required.

THE BIRCH, or *Birk*, Scotland.*(Betula alba.)*

The Birch is a well known, hardy, low growing tree, of a delicate and fragrant foliage. When growing single, and in a sheltered situation, it assumes a pleasing form. The variety with pendulous branches, called the *Weeping-birch*, is certainly a very elegant tree, and desirable wherever ornament is an object. Whoever has strolled on the banks of the Dee, in Aberdeenshire, after a gentle summer shower, must have been delighted with the appearance, and regaled by the fragrance of the weeping-birches which decorate its banks.

If planted in good soil, in the grove manner, and if properly trained, the Birch becomes a timber tree of considerable size. It is an excellent coppice plant; and is very generally found in that character in the Highlands of Scotland, and in many other parts of the country.

Birch may be said to be the universal wood of the Scots Highlanders. They make every thing of it; they build their houses of it; make their beds, chairs, tables, dishes, and spoons of it; construct their mills of it; make their carts, ploughs, harrows, gates, and fences of it; and even manufacture ropes of it! Birch is also used in many other parts of the country, in machinery, turnery, wheel-

work, and for lasts, pattens, wooden shoes, and such purposes. It is likewise much used in collieries, for props, and waggon-road sleepers. It is an excellent fuel, burning very clear, and emitting less smoke than most other woods. In the smoking of herrings, in particular, Birch is preferred to all other kinds of wood.

The bark of the Birch is very astringent, and affords a tan perhaps inferior only to that of the oak; with which it is used in mixture, in many parts of the country. A liquor, or juice, is extracted from it, which, when it has undergone the vinous fermentation, is called *birch-wine*; it is drawn off by tapping the trees in spring, or early in summer. When properly manufactured, it makes a cooling, agreeable drink. PALLAS, in his *Flora Rossica*, says, that the well known and highly esteemed Russian leather owes its agreeable smell to being anointed with an oil extracted from the Birch. He thus describes the process.

“The oil is prepared from the white bark, either taken from the live tree, or collected from those that are putrid in the woods. It is best made from the latter; because by the putrefaction it is freed from the inner bark; and the external white bark remains uncorrupted for ages, as appears by the old burial-places at Janisea, and the vaults of the very ancient Castle of Moscow, which I observed were covered with birch bark. The bark is gathered into a heap, and pressed into pits made in the shape of a funnel, prepared in clay soil;

and when set on fire, it is covered with turf. The oil, distilling through the clay hole at the bottom of the funnel, drops into a vessel placed to receive it; and it is then tunned into casks made of the hollowed trunks of trees. The pure limpid oil swims at top, and is in the greatest request for anointing leather on account of its antiseptic quality. The residuum is thick and sooty, and is employed for various common uses."

THE CHERRY, or *Gean*.

(*Prunus aviam.*)

The Wild Cherry, or Gean, is a well known, handsome, middle-sized tree, of peculiar beauty in spring when in flower, and in August when in fruit: In autumn, before its leaves begin to fall, they exhibit beautiful red and yellow colours. It is therefore very fit for the decoration of the park and the lawn. At the same time it is a proper grove tree, and is admissible in the forest; where indeed, as before observed, it is often found growing in a natural state, having probably been sown by birds. There are two varieties of the Gean, the red, and the black fruited; but they differ in no other respect. The large red, and the large black Geans, so well known as fruit-trees in Scotland, are sub-varieties of these, improved by culture, and are only to be had by grafting or budding.

The Wild Cherry grows to be a tree of a very considerable stem, so as to produce good sizeable boards and planks; and its timber is beautiful, durable, and is used for many purposes. By the cabinet-makers, in particular, it is used for chairs, tables and the like. It takes a fine polish, and, by a little staining, is made nearly to resemble mahogany*.

THE CHESNUT.

(*Fagus castanea.*)

The Sweet or Spanish Chesnut, is a strikingly grand tree of the first magnitude. Whether we consider the rich appearance of its foliage when standing single, the bold forms its branches take, or the general outline of the tree, it is a superb object, emulating, and even outstripping, the oak in these respects. It is therefore most highly proper for the decoration of the park, and of the lawn. Many Chesnut trees, however, should not be planted close to a residence, because the flowers emit a very disagreeable odour, which is offensive to most people.

The timber of the Chesnut more nearly resembles oak in its appearance, than that of any other

* In many parts of the country, it is called, by the cabinet-makers, *Scots Mahogany*.

tree ; and next to the ash, and the Scots elm, of the hard timber kinds, approaches it in value. It is exceedingly durable. The roof of Westminster Abbey, and that of the Parliament-house in Edinburgh, are constructed of it. The beams, roofing, &c. of many wooden houses in Edinburgh, lately pulled down, and which had stood for ages, were found to be of Chesnut ; and, from the city records, it appears that large oaks and chesnuts formerly covered a place called *the Borough-moor*, about two miles to the south-west of the city, where no trees now exist.

Chesnut is used, besides, by the cabinet-maker, for various purposes. For pipes to convey water under ground, it excels the elm, and perhaps equals the oak. It is more durable than the oak as gate-posts, or where it stands wet and dry, and is next to the yew and the larch in this respect. In Italy and Spain, their wine casks are chiefly made of it ; and it is said to possess the singular property of not shrinking, nor tinging wines or other liquors put into casks made of it.

It is a good coppice tree ; and is very generally used in the hop counties for poles. Chesnut stakes, for fencing, are also much used in the south, and are found very durable. Its bark is a strong astringent, and affords a tan equal to that of the larch or mountain-ash.

THE HORSE-CHESNUT.

(Æsculus hippocastanum.)

This is an elegant tree, of beautiful foliage and flowers; leafing more early in spring, than most others. It is a native of Asia, but grows freely in this country, and arrives at a great size; and, when standing single, takes a handsome form: Its flowers in spring and its fruit in autumn, contrasted with its fine leaves, afford a pleasing variety. The variegated kind, and the scarlet-flowering species, are much esteemed*, and are extremely ornamental. Indeed they are all merely ornamental trees, only fit for the park and the lawn.

The timber of the Horse-chesnut is of less value, perhaps, than that of any other tree; yet it has of late been applied to several purposes, as a matter of necessity, arising from the scarcity and high price of other woods. It has been used in the building of temporary shades and out-houses, cattle shades, &c.; for the *cleathing* of stone-carts, as it does not easily splinter or rag, like deal, though it will readily break over, if not of considerable thickness; and for lime-boards, troughs, boxes, and the like.

* The variegated sort is propagated by budding. The scarlet-flowering species (*Æsculus pavia*) is also, in general, propagated by budding on stocks of the common horse-chesnut.

THE ELM.

Ulmus montana, Scots Elm. *Ulmus campestris*,
English Elm.

The Scots or rough-leaved Elm, is a deciduous tree of very considerable magnitude. It cannot, strictly speaking, be termed beautiful; but certainly an aged Elm, when standing single, is a very capital object. In the form of its branches, and its general outline, it much resembles the oak. Hence in many of the recently improved places in Scotland (where this tree chiefly abounds), it has been reserved as an ornamental tree, and, in this particular, is an excellent substitute for the oak. Even where the oak and the chesnut abound, (as at Alva), the Scots Elm maintains its place, with excellent effect, as a park tree.

In the grove, if properly nursed and trained, it becomes a straight, tall, and large-stemmed tree. In hedge-rows, it becomes most useful and durable timber. And in open woods, it naturally assumes many fine casts and forms for the purposes of ship-building and the like. In short, the timber of this tree is so useful and valuable, that it is always prized next to the oak. It is used by the ship-builder, the boatbuilder, the block and pump maker, the cart-wright, the cabinet-maker, and the coach-maker.

In regard to the fine-leaved, or English elm, we may first remark, that although there are many English elms in Scotland, yet there are very few Scots elms, comparatively speaking, in England. In a late tour through most of the counties of England, we hardly observed a Scots elm after leaving Northumberland going southward, until we entered Cumberland returning northward. Indeed, it may be said, that the rough-leaved, or Scots elm, of any useful size, is to be found only on the north side of the Tweed.

The fine-leaved or English elm is very ornamental, when it stands detached and free ; as, by the Thames, at Hampton-Court, at Bushy, at Richmond, and by the high road, about halfway between Cheltenham and Tewksbury. It affords an agreeable shade, (nearly equal to that of the lime), when formed into avenues ; as at Windsor, York, and Cheltenham. It may be a useful, but, as it is generally treated all over England, it is an ugly and disgusting *hedge-tree*. Nothing certainly can be more tiresome, in travelling through the flat counties, than the continual succession of meagre elms like poles ; from which we are now and then relieved by Lombardy Poplars ! which are worse if possible ; though occasionally, no doubt, by a much finer plant than either, the Elder.

The timber of the English, compared with that of the Scots Elm, as above distinguished, is very

inferior, both in durability and in value. In the sales of these timbers, the English Elm, among good judges, seldom brings more than a half, or even a third part of the price of the Scots Elm, although both be of equal size and age. Prejudice, no doubt, may have some share in this matter ; but certainly the timber of the one is very inferior to that of the other. Indeed, if it be considered, that the one species is exceedingly hardy, and universally raised from seeds, and that the other may even be termed delicate, at least in Scotland, there can be little hesitation in determining which deserves the preference as a forest tree. The English elm is too frequently reared from layers and suckers. These never make the best trees ; and they always produce suckers from their roots, and disfigure the grounds in which they stand. When intended as ornamental trees, for the park or the lawn, they ought to be budded, or grafted, on the Scots elm ; in this way, trees of superior vigour and figure will be obtained, and will never produce a sucker.

THE HAWTHORN.

(*Cratægus oxyacantha* *.)

The Hawthorn is to be found growing in most places of the kingdom, we might say of Europe,

* *Mespilus oxyacantha*, *Smith's Fl. Brit.*

in various characters :—as underwood, in the forest, and in the park ; as a detached tree, or in groups, on the lawn ; as a shrub ; and as a fence.

As underwood in the forest, where it grows spontaneously, it may rather be considered as out of place, and a nuisance. In the park, if growing at the foot of, or near to a fine oak, it has an excellent effect. As a detached tree, if large and well formed, the Hawthorn never fails to please. When clustered in handsome groups on the lawn, Hawthorn-trees are very ornamental, particularly when in blossom. As a shrub, or a bush overhanging a rill, in a valley or dell, by the end of a mill, or the side of a cottage, the Hawthorn appears to great advantage. The scarlet flowering variety is capable of attaining a size equal to the common, and is highly ornamental. Indeed most of the varieties of the thorn are desirable as ornamental plants in the lawn. As a *fence*, when properly trained, the common white and scarlet flowering thorn, are surpassed by no plant whatsoever. The wood of the hawthorn, when it arrives at the size of a timber tree, is of the most durable quality ; and is much in request for mill-cogs, and the like. The timber of the Hawthorn is often spoiled through inattention after cutting. If it be allowed to lie in the tree, it soon heats and becomes quite *frush* (brittle) and worthless : It therefore ought to be instantly cut up into planks and laid to dry.

THE HORNBEAM.

(Carpinus betulus.)

The Hornbeam, in its general appearance, very much resembles the beech, but it does not grow near so large. It is not now, however, planted as an ornamental tree, and but seldom as a timber one, although it certainly deserves a place in the forest. It is often planted as a screen, and as a fence; to which offices it is well adapted; being very hardy, and retaining its leaves (like the beech) in a shrivelled state, over winter.

The timber of this tree is nothing inferior to the beech, for any purpose to which beech is usually applied; and for some purposes, (as mill-work), it is preferable. It makes good fuel, and affords excellent charcoal. In some parts of England it abounds in natural copses; and forms an excellent cover for game; and also produces good stakes for fences and the like.

THE LABURNUM (broad-leaved variety).

(Cytisus laburnum.)

This has been much planted as an ornamental tree, and, in Scotland, even as a timber tree. It has a full claim to both characters. It is certain-

ly very beautiful when in flower, standing single, and being allowed to form its own natural head ; or as a border tree around other plantations. In the grove, it may be trained to a fine stem, of very considerable size.

The timber of this tree is at present the most valuable, and high-priced, of any that grows in this country. There was a considerable quantity of it sold, at Brechin-castle and Panmure, in November 1809, by public sale, at fully *half a guinea per foot* ! It was all bought by cabinet-makers ; who were as anxious to get the small and middle sized trees, as they were to have the large ones. Some of the above wood was very old, and large ; and in order to prevent any demur with respect to its quality, it was all cut down before the sale, and was found good, and sound *. In 1806, at a public sale, a quantity was sold at 7s. 6d. a foot.

THE LARCH.

(*Pinus larix.*)

The Larch is a tree of great beauty, magnitude, and value ; and when standing detached, is cer-

* It may be proper to notice here, that the Laburnum timber which brought so high a price, was of the variety called the *Tree* Laburnum ; the shrubby sort never arrives at any

fainly highly ornamental. A grove, or a group of larch trees, forms a pleasing object at any stage of its growth ; when young it looks extremely gay ; when grown up, the spiry heads of the trees have a fine effect, especially if contrasted with broad headed trees, prominent rocks, or bold ground. In mixed plantations, the larch is conspicuous at every season, and very much enlivens the appearance of the other trees. A plantation of firs has a gloomy appearance at particular seasons of the year : But were a few larches introduced on its borders, or a few groups of them planted at irregular distances, or particular points ; or if even any accidental blanks were filled up with larches, the decided improvement on its effect, would speedily be perceived and acknowledged.

It would therefore be difficult to point out a station where the larch could not be admitted. It certainly, however, is best fitted by nature for the grove, or the forest. There the larch will yield to its cultivator in the shortest time possible, the greatest return in full grown timber.

It is, however, an important fact that the larch affects an inland and elevated situation. It will

considerable size, and should never be planted as a forest, or even an ornamental *tree* ; being only fit for the shrubbery. The Tree Laburnum is easily distinguished from the shrubby, by the greater size of the leaves, and the superior length of the bunches of flowers.—See article *Nursery*, for September.

not, even in the best soils, and apparently the most toward situations, grow up to perfection. We have known it in several places make the most rapid progress for 30 or 35 years, and though there was no external signs of disorder, yet, when it was felled, the wood had begun to rot in the hearts of the trees ; so that there was scarcely a sound tree over a large extent of ground ; yet here, the Oak, the Chesnut, the Elm and the Ash, amongst which the larch had been used as a nurse, are not only in the utmost vigour, but their wood is perfectly sound. Some larches in a similar soil and situation, had attained 7 feet girth, and were quite hollow a good way upwards*. These instances, however, afford no argument against the use of the larch as a nurse : Indeed, no tree is so eminently qualified for that office. In most situations, even in very exposed places and thin soils, it outgrows all other timber trees, for the first ten or twenty years after planting ; and if planted in sufficient numbers, in proportion to the principal trees to be nursed, it affords them good shelter ; while by its towering, it tends to draw them up for timber†. It will arrive at a timber size in

* See note at page 59.

† Objections have been made to the Larch as a nurse, from the circumstance of its leaning over upon the principal trees, in very exposed or windy situations. It is generally in consequence of being planted too sparingly, that it does so ; or it happens chiefly where the plantation is a mere stripe, or a

almost any situation or soil, (as already noticed), and of course, it may with propriety be planted on a broad and extended scale, and may be expected to make the most durable *timber*, on the more elevated and exposed situations, where the soil is not of a very rich quality. Certainly, had the vast forest tracts, which have lately been planted with Scots Firs, in many parts of this country, been planted with Larches, at least in those soils and situations adapted for them, the properties would have been greatly enhanced in value, the Larch bearing the ascendancy over the Scots fir, in the following important circumstances ;—that it brings double the price, at least, per measureable foot ; that it will arrive at a useful timber size, in one half or a third part of the time in general, which the fir requires ; and above all, that the timber of the Larch, at thirty or forty years old, when placed in soil and climate adapted to the production of perfect *timber*, is in every respect superior in quality to that of the fir at a hundred years old. In short, it is probable that the Larch will supersede the Scots fir in most situations in this island, at no very distant period.

The general usefulness of Larch timber is now pretty well known, in most parts of this country ; it is therefore hardly necessary to enumerate the

patch. At any rate, by the time that nurse plants arrive at such a height as to be capable of bending over upon the principals, they should be removed.

purposes to which it is applicable. It may be enough, perhaps, to state, that it is useful in ship-building *, in house-building, in husbandry, for machinery, and in cabinet-making. It is exceedingly durable in any situation ; and perhaps more so than any other timber, when placed under water, or in ground where it stands partly wet and partly dry. It is therefore most useful in the construction of mill-dams, sluices, or the like ; for mill-cogs, gate-posts, &c. ; in which latter character, the bark should be retained on the part to be sunk, and an inch or two above the surface of the ground ; the bark of the Larch being almost incorruptible.

Besides the great value and usefulness of Larch timber, the tree possesses other properties. Turpentine is extracted from it ; its bark makes a good tan ; and its wood forms an excellent, lasting fuel.

THE LIME.

(Tilia Europæa.)

The Lime is a well known, large growing, deciduous tree, of great beauty and fragrance when in flower. It is generally accounted a native of

* There have been two vessels built of Larch from his Grace the Duke of Arhol's woods. The last, *The Larch*, was launched at Perth on the 6th of August this year (1819.)

England. It is very ornamental, in all its varieties ; more especially the *red-twigged Lime*. The lime is to be found as a standard, or as an avenue tree, about most residences of note in the kingdom. It is seldom planted in the grove ; but often as a screen, in single or double rows. The Lime is capable of affording a very complete shelter, and a most agreeable shade ; and perhaps no tree is better adapted to the formation of an avenue, or a walk, near a residence. Indeed, it has been preferred for these purposes, by common consent, for more than a hundred years back*. It is a very general and conspicuous lawn tree ; and in the park, it forms a fine contrast with the oak, the chesnut, the elm, and the sycamore.

The timber of the Lime is chiefly used by the carver and the turner. It has been of late applied to the lining of carts, and to other purposes in husbandry. Being light, soft and smooth, it makes hay-rakes and fork-handles, which are better liked by female haymakers, than those of fir or ash. Its charcoal is often used in the manu-

* An avenue may be made too broad to have a good effect : That is to say, it may be made so spacious as effectually to sink the height of its trees, even when full grown. The avenues at Castle-Howard, Stowe, Bushy, and some other places in England, have this defect. The Lime avenue at Taymouth in Scotland, may be reckoned too narrow ; but certainly it is very striking, and forms a grand Gothic canopy. Its trees would have met, although they had been planted twenty feet farther apart.

facture of gunpowder ; and of its inner bark macerated in water, are made the bass-mats, so much employed in the packing of goods.

THE OAK.

(*Quercus robur.*)

The Oak is so generally known, and so universally esteemed, that we shall be very brief in our observations on it in this place. It is the pride of the forest, the glory of the British Navy, and the stay of the nation !

The Oak is ornamental in the highest degree, taking it as a tree simply, and abstractly from any consideration of its great usefulness. A young oak, if in health, is rather elegant ; a grown oak is beautiful ; and an aged oak is a very grand object. It can hardly be placed wrong : it is in character in the forest, the grove, the park, the lawn, and by the wayside. In very bleak, exposed situations, it will not attain to the size of a tree, and especially when planted single. When single trees of oak are to be planted, it should be done in their favourite soil, a strong deep loam, on a dry bottom.

THE PLANE.

(*Platanus orientalis*, and *P. occidentalis*.)

Both of these species, with their varieties, are fine ornamental trees. In their native places, the

former in the East, and the latter in North America, they grow to an amazing size. The Eastern Plane, with its varieties, (called the Spanish, and the maple-leaved), are more esteemed than the American kind, their leaves being larger and more elegantly formed. The general outline of these are very much alike.

These have hitherto been considered *merely as ornamental trees* in this country, having been chiefly confined to the decoration of grounds, and even but seldom planted in the park. The disastrous effects of frost on the largest American planes in England, those in Richmond Park, at Kew, at Sion House, at Stowe, at Painhill, and several other places, has alarmed proprietors of this fine tree. It is evidently less hardy than the Asiatic plane; because, in many instances, we have observed trees of both species standing near each other; the Eastern kind being nothing injured by the effects of the frost in 1809, while the trees of the Western kind were either entirely killed, or so much injured that their recovery was despaired of*. It is very singular, that of this spe-

* In the neighbourhood of London, in particular, in June 1809, a severe frost fell, which caused the above disaster. The trees were just breaking leaf; the foliage was killed; they pushed late in the season; an early autumn frost again destroyed their feeble shoots; their juices therefore stagnated. The trees made an effort to push in 1810; but failing, finally languished, and died.

cies, the larger trees *only* were killed. Trees of from twenty to twenty-five feet in height, were little hurt; and smaller ones nothing at all; at least in every instance that came under our observation. We did not observe or hear of a single Oriental plane being injured in any part of the country.

The timber of the Plane, so far as it is known in this kingdom, is said very much to resemble that of the sycamore.

THE POPLAR.

(*Populus alba, angulata, tremula, &c.*)

These are all very tall growing trees*, and are either indigenous to Britain, or naturalized to many parts of it. There are some other species planted, and many varieties; and they are all reckoned ornamental. As ornamental trees, however, about the grounds of a residence, they are only admissible in low, wet situations, where they luxuriate most, and take the best forms. In such

* In the Reay wood at Castle-Howard, there are some of the largest black poplars that we have ever met with. One tree is twelve feet in girth, at four feet high, with a stem of at least sixty feet (measurable timber), and its total height about ninety. Another is as tall, and only nine inches less in girth. They grow on the north hang of a small hill, in deep, loamy soil.

situations, even the Lombardy poplar is sufferable*. A swamp or morass in a park, which it is not thought advisable to drain, or otherwise improve, may be beautified by being planted with poplars, either in groups, or in mixture with willows, alders, and birch. On account of the quickness of its growth, the Poplar, even in a dry soil, and pretty high situation, very soon becomes a screen and a shelter to slow growing plants.

The timber of the White Poplar, or Abele, has always been esteemed the most valuable sort. It has been used in the flooring of rooms, in mill-work, by the turner and cooper, and is said to be very durable. It takes a very fine polish, and is often employed by the cabinet-maker. The timber of the Black Poplar is perhaps little inferior. The bark of the Black is a strong astringent, and

* Excepting near the cathedral at Dunkeld in Perthshire, we do not recollect of having seen a Lombardy Poplar that could be looked upon with any degree of pleasure. We think it a very ugly tree; and the newly introduced Italian sort promises to be little else. Indeed, many have ventured to assert, that it is merely a play upon the vanity of possessing new sorts which some people display, and is not really distinct from those formerly cultivated. The prevalence of poplars in the vicinity of London, and other places in England, is tiresome in the extreme; and the monotony is nothing relieved by the accompanying tree, namely, the English elm, *sadly disfigured*.

a good tan*. The wood of the Aspen-tree, or Trembling Poplar, is much of the same quality; but seems somewhat coarser in the grain. We have known quantities of this last-mentioned kind purchased for the making of red herring casks.

THE SYCAMORE, or *Plane-tree* of Scotland.

(*Acer pseudo-platanus.*)

This is a timber tree of the first magnitude. It is highly ornamental; and maintains its place, with great stateliness and boldness of outline, in the park and on the lawn. The variegated kind is extremely beautiful, and is admitted in all polished scenery. The common kind is very frequently found standing alone, or in small groups, about farms, cottages, mills and the like, to which it is an excellent accompaniment, and a protection from the chilling blast. It is also very frequently to be found about old ruins. Perhaps no tree that we have in this country can compare with the sycamore for longevity. A very striking instance occurs in the Prior-Letham plane, mentioned in a note, page 64. This tree is mentioned in a

* The Black Poplar grows most rapidly of any of the kinds. I planted of them in 1813, only two years from cuttings, and in 1817, many of them were in girth no less than 21 inches. I have seen a tree of this kind 18 years old, which was in girth 7 feet 8 inches.

lease that was granted of these grounds near 200 years ago, wherein it is called "the large plane," and cannot probably be less than 500 years old. There are also now growing at the north side of Castle Campbell near Dollar, a few of very great age. The Sycamore is common in hedge-rows and division-rows of fields, especially in Scotland. It is among the most hardy of our trees ; and affords more shelter, when grown up, than any other tree. It possesses a singular property : it never shows what is called *a weather side*, even in the most exposed situations, on the sides of bleak hills. If it has been too closely pressed, and been misshapen by another tree, or a wall, it will, very soon after the removal of the obstruction, assume its own regular form, and become equally poised.

It is a very fit grove tree, and is now become a valuable one, as, in that character, it may be trained to a very long, clean, and large stem, which is required for many purposes in our large manufactories, and is in particular request for making herring barrels. It is an excellent nurse plant, along with the Elder, in all situations exposed to the sea-breeze.

The timber is very much in request for many parts of machinery and mill-work ; for cotton printers' blocks ; for the turner, the cooper, and the cabinet-maker. Particular trees, for making rollers and such purposes, have been sold as high

as three half crowns a foot. In many parts of Scotland, sycamore timber brings a price next to the ash.

THE WALNUT.

(*Juglans regia.*)

The walnut is well known as a fruit tree. It is a plant of beautiful and fragrant foliage, and has been very much planted as an ornamental tree, without regard to its fruiting. It is very fit for the decoration of the lawn, or for any ornamental plantation about a house. A grove of walnut trees, or a walnut orchard, is a very delightful thing in the grounds of a place. In the view of rearing the walnut for timber, it should always be planted in the grove manner; because it does not otherwise rise with a good or a tall stem. The finest walnut trees perhaps in the country, have been drawn up in a mixed grove plantation, until they arrived at a good size.

The timber of the walnut is very valuable. It is used in cabinet-making; but, above all other woods, it is in demand for the making of gunstocks. Indeed, so much has it lately been in request for this purpose, and so great a price has been paid for it, that but comparatively few large walnut trees are now to be met with in the country.

THE WILLOW.

(*Salix alba, Russeliana, fragilis, cinerea, caprea.*)

There are many species of the Willow; and some of them very ornamental. The most conspicuous, and which grow to a tree size, are the Huntingdon, which we presume to be the same with the White Willow (*Salix alba*); the Bedford Willow (*S. Russeliana*); the Crack Willow (*S. fragilis*); the Grey Willow (*S. cinerea*); and the great round-leaved Sallow (*S. Caprea*). To these may be added, the Crack Willow (*S. fragilis*), and the Red-twigged Willow formerly mentioned.

As ornamental plants of lower growth the Rose Willow (*S. helix*), the Sweet or bay-leaved (*S. pentandra*), and the Golden Willow (*S. vitellina*), may be mentioned. All of these, excepting perhaps the Red-twigged, are natives: some foreign species are likewise of an ornamental kind, particularly the Weeping Willow (*S. Babylonica*), which is a native of the East.

None of the species, however, tower so fast, or become so useful, as the Huntingdon, the Bedford, and the Red-twigged*. Were the Huntingdon

* The Huntingdon is the most common willow pollard in England; few grown trees of it are to be seen in that country; while, in Scotland, many very large trees are frequently

not so very common, and so frequently met with in low or mean scenery, it might, perhaps, be reckoned more ornamental than many of the other kinds. They certainly are very elegant plants while young, and in middle age: and if not picturesque when grown old, yet there is something very striking in their hoary and reverend appearance.

The most natural situation for the willow is in low moist ground by the sides of rivers, brooks, lakes, &c.; and many of the kinds, by the lightness of their branches, and the elegance of their foliage, being planted in groups or in mixture with other aquatics, give much life and beauty to such scenery. The willow, however, especially the Huntingdon, will grow and thrive well in higher and drier grounds: and if this kind were planted in the grove manner, perhaps, no other plantation, excepting larches, would give so quick a return for the trouble and expence of planting. It is an excellent coppice wood, grows extremely fast, and is very valuable. It is likewise an excellent nurse to other plants placed in humid situations, as in such it outgrows all other trees.

to be met with. The barbarous custom of pollarding trees has not yet made very wide strides in the North; and it is to be hoped that it never will: however, we felt a good deal vexed on lately seeing some fine oaks and beeches decapitated, both as standards and in the grove; and many pruned, mangled, and rumped up, to "make them look English like."

The timber of the willow is used in turnery, in mill work, in cooery, for boarding, &c.; the stronger shoots and poles serve for making hoops, and handles; and the twigs are employed in wicker work.

The bark of the Huntingdon Willow has lately been found to be a tan equal in value to that of the birch or the mountain-ash. This kind, therefore, as said above, is a most valuable coppice wood, on account of its rapid growth. The bark of the Bedford Willow is of equal value as a tan.

Charcoal of the Sallow (*Salix caprea*) is a chief ingredient in the manufacture of gunpowder; and plantations of it, for that purpose, have been found very profitable. The shoots which are used in this manufacture are from ten to fifteen feet in length, and generally about an inch in diameter when peeled; so that the plantation would require to be made in very good soil, in order to have them produced of these dimensions*.

THE BALM OF GILEAD FIR. (*Pinus balsamea*.)

This is an American species, and is esteemed a very ornamental evergreen tree. Its appearance is like that of the silver-fir; from which it is, among

* For some account of the kinds of willows fit for basket-work, &c. and of the formation and management of osier plantations, see Appendix, No. 1.

other circumstances, distinguished by the fragrance of its leaves. It may be considered a lawn tree; and as such, if planted in good deep soil, and allowed a sufficiency of room, it will take a fine form, and arrive at a good size. A more fit station for this plant, however, is in a screen plantation near the house; or on the margin of a grove; or in a grove by itself, unmixed with other trees.

The timber of this tree is of a quality equal to that of the silver-fir, though it seldom arrives to the same magnitude, and it produces turpentine, it is said, of a more balmy and fragrant nature.

THE SILVER-FIR. (*Pinus picea.*)

This is a very tall growing, well known timber tree. When allowed a sufficiency of room, and to take its own natural outline, it is a very beautiful object, of a fine conic form. In this case, there is something in its appearance which gives an idea of great stability; it seems to be placed on a firm base, its stem and general outline tapering, in uniform proportion, to a summit at a vast height. But it is a tree of a very different appearance when haggled, lopped, and pruned of its lower branches; for, if these fall not down to the turf, its grandeur is in a great measure lost.

The silver-fir may therefore be considered as an ornamental lawn tree of much value. It is cer-

tainly an excellent screen, and a more fit, and more handsome plant for that purpose, near a residence, than the common spruce.

It is a tree abundantly hardy for the forest ; and its timber is among the most valuable of resinous woods * ; even the larch itself, when grown in the soil and situation best adapted to its nature, is not greatly superior to it : But to obtain large logs of clean timber of this, as indeed of all the other firs, it is necessary to plant them close together as a grove, or in the forest, and give them the same treatment as advised for the other firs.

In Switzerland, the Silver-fir grows naturally to a wonderful size, and is esteemed among the most valuable of their trees. From it is extracted turpentine, of a quality superior to that extracted from the larch.

AMERICAN SPRUCE FIR.

(*Pinus nigra, rubra & alba.*)

The Black, Red and White varieties, are easily distinguishable from each other. The White by its more vigorous habit and light colour ; the Black

* In July 1810, we saw several very large logs of Silver-fir, at Woburn, from trees which had been cut out of the park there. They struck us as being the finest native timber we had ever seen ; superior, at least in appearance, to the native Highland fir of Scotland.—The soil about Woburn is light and sandy.

by its deeper green colour, and less robust habit ; the Red more nearly resembles the black, only its foliage is finer, and the branches more pendulous.

They have all hitherto been used in the shrubbery, and on the borders of ornamental plantations, where they might be always in view. The black and the red are highly suited to such situations, and when the soil is adapted to them, they never fail to please : Both of them affect a soil of a mossy nature, where there is a sufficiency of moisture. Nothing can have a finer effect, than a patch of black or red spruces in a piece of mossy soil in a sequestered part of a wood.

The White American Spruce is a very hardy tree, and will thrive better, and make finer plants on exposed situations, than the common or Norway spruce. It can hardly be admitted as a border tree in a shrubbery or small plantation, because it quickly attains too great a size, and offers to make valuable timber. It is now pretty generally raised from seeds, and is sold in most of the nurseries as a forest tree. The red and black varieties have been too generally raised from layers, which certainly is the most effectual means which can be pursued to bring them into contempt as trees. This method of raising these plants may answer where they are wished only to form low-growing shrubs, but never for making trees. Those which are intended for growing to trees should be raised only from seeds.

THE COMMON, OR NORWAY SPRUCE FIR.

(Pinus abies.)

This is a very hardy forest tree of considerable value. It is the loftiest of European trees. It has certainly, however, but few pretensions to the title *ornamental*. Next to the Lombardy poplar and the Scots fir, we think it the least so.

This tree should never be planted for the sake of its wood, excepting in masses or groves by itself; otherwise its timber is so coarse and knotty, that it is hardly worth working: But in the mass way, if planted thick, and properly pruned and thinned afterwards, it may be trained to tall clean timber.

The white deal, or Memel fir, so long and hitherto so plentifully, imported from the Baltic, is the produce of this tree; and therefore the value of its timber cannot be questioned. In Denmark, Sweden and Norway, it is grown thick in natural forests, or planted groves; and hence its length and cleanness of stem. But the *use* and the *planting* of this fir, in this country, may be said to be superseded by the introduction of the larch, save in peculiar situations.

It answers remarkably well as a nurse tree, in all soils naturally adapted to its growth; because it preserves its conical form, and remains stiff and

erect, allowing the tops of the hard wood more scope, and never has the inconvenience of *weeping* its neighbours. It forms a cover for game in plantations when young, and if headed down before the undermost branches lose their foliage, it will continue for a great length of time as underwood. When managed in this manner in narrow stripes and screen plantations, it has the best effect. It produces that necessary article Pitch.

THE PINASTER. (*Pinus Pinaster.*)

This is a forest tree of very considerable size ; and found, especially on the western shores of Scotland, to be very hardy. It might, therefore, if properly managed, perhaps be successfully used as a nurse for other more valuable kinds. It sends out more rampant arms than even the Scots fir ; which would therefore require to be lopped timeously, or before they could injure the principal plants.

Some even plant this fir with a view to ornament. But an old pinaster, which never has been curbed or pruned, certainly looks somewhat fantastical.

THE SCOTS FIR, or *Wild Pine.*

(*Pinus sylvestris.*)

Next to the Grampian birch and mountain sorb, perhaps, this is our most hardy forest plant. It

has, at least, been esteemed so till of late ; but another, of a finer form, and much higher value, has been found ; namely, the Larch. The Scots fir must, however, still be considered as a valuable plant on very exposed sites and peculiar soils, especially as a nurse. As nurses for rearing oaks from seeds, Scots firs are used with good effect, as well as in many other respects.

The value of the *Highland fir* of Scotland is well known, as being not inferior to any imported into this country, either in cleanness or durability, where it has been grown under favourable circumstances, on its proper soil, and to a sufficient age. Owing to the scarcity, and high price of foreign timber of late years, the demand for Highland fir has very much increased. Indeed, the high price given has been the cause of much premature felling ; and many of the Scots natural forests are now very much lessened in extent by the operation of these causes.

The *planted* Lowland Scots fir, is seldom applied to offices higher than that of roofing of shades or huts ; lining of carts ; lathing, or making of packing-boxes ; while the natural or self *sown* is fit for the finest purposes : But were this tree, even the common variety, in the character of a planted tree, cultivated with more care, it certainly would become more valuable timber. But we seldom see the smallest care bestowed upon its culture. Every where, almost, the trees are unpruned ; the

dead branches are left sticking in their places ; and the trees thus allowed to increase their diameters over them ; so that, when they are felled, the timber is condemned as worthless. A contrary, and more rational, system of management, would evidently place this useful plant in a more favourable point of view, than prejudice will at present allow it. If once the *red wood* variety were generally cultivated, the Scots fir would rank amongst our most valuable timber trees *. We have seen this variety at Caristoun and Brechin-Castle, and other places in the north.

It may be proper to notice, that pitch is extracted in great abundance from the Scots fir.

THE WEYMOUTH PINE, (*Pinus Strobus*.)

This is an elegant tree ; and it grows to a very great size. It is admissible in all ornamental plantations, either in groups, or on their borders. In sheltered situations, it becomes a fine looking single tree. In the grove, however, it is sure to become most valuable ; and it should, like all other pines and firs, in this point of view, be planted by itself, not in mixture with any other sort of wood.

In America, this is, perhaps, the most valuable of the pine or fir kinds. It grows to a very great

* See Note, page 65.

length and size in New England, and other provinces; from whence vast quantities are imported. It seems, however, to be a plant of so delicate a habit, as to prevent our expecting it ever to become so large or so valuable a tree with us, especially in exposed situations. Even in sheltered situations, without much care, it makes but a sorry timber-tree.

THE CEDAR OF LEBANON.

(*Pinus Cedrus.*)

This has always been esteemed an ornamental tree, and we believe, has only been planted as such in this kingdom. The finest we know of are at Stow *, Painshill, and Blenheim. There are none so large as these in Scotland, though several of a pretty large size are to be found in that country.

We need not attempt the rearing of it merely as a timber tree. Its growth is so slow with us, that although its wood, when obtained, is abundantly durable, yet, even then, it would seem to be fully equalled by other kinds, which are far more readily and easily reared, as the Larch. Yet,

* The largest Cedar at Stow, in 1810, measured, at 4 feet above the surface, 12 feet in girth;—the stem 40 feet to the cleft; and total height, by estimation, 65 feet. It is said to have been planted about 90 years ago.

in ornamental plantations, where there is natural shelter, and a good depth of soil, it may be planted with considerable success.

THE HOLLY.

(*Ilex aquifolium.*)

The Holly is one of the most ornamental trees. It is also one of the most hardy. Besides the common green holly, there are many of its beautiful varieties, which arrive at a tree size, and are peculiarly adapted to the decoration of the lawn. In all ornamental plantations they claim a conspicuous place. There is something so extremely cheerful in the Holly, particularly late in autumn, and in winter, that, wherever it appears, it never fails to command attention, and to please.

The common Holly is often found growing naturally in woods and forests, as an underwood to the oak, the ash, and the fir *; in which situation it appears to great advantage, giving much variety

* The greatest collection of natural Hollies, we recollect to have seen or heard of, grew in the fir forest of Blackhall, on the river Dee, about 20 miles above Aberdeen. Many of them were very large and well stemmed. The greater part of this forest has been cut. The Holly timber which grew in it was sent to London, and a very high price was obtained for it. Probably the name *Holly-bank*, at Gordon-Castle, points at the existence of such a forest long ago.

to the scene. It is, therefore, a most fit underwood for the park ;—an appropriate accompaniment to the oak, the chesnut, and other park trees, and is highly useful as an underwood in all screen plantations. It is also very proper to be planted by the sides of walks in the grove ; few plants thriving better under the shade of other trees. Many of the variegated kinds do equally well in such situations, though their colours do not appear so striking as when exposed.

The timber of the holly is very valuable. It is chiefly used in inlaying and veneering, and by turners :—it is almost as white as ivory. Birdlime is extracted from the bark of holly.

THE YEW.

(*Taxus baccata.*)

The Yew is found native in different parts both of England and Scotland. As an ornamental tree, it is less in repute than it has formerly been. Nevertheless, it will be allowed that an aged yew is a striking and interesting object. It arrives at a great size, and lives for many centuries. Whoever has seen those at Fotheringall and Kincardine in Perthshire, and at Himly-hall in Staffordshire, will allow an aged yew to be a very picturesque tree.

The yew has been cried down as a standard in pasture grounds, on account of the poisonous na-

ture of its leaves ; but this is not a sufficient reason for entirely discarding it, since a tree or two might be always kept particularly well fenced. We know, however, of many yew trees without fences in pastures ; and also hedges, which are uniformly browsed on by sheep and cattle. Goats are particularly fond of yew leaves ; yet we never knew of a beast having died in consequence ; or even met with any person who could say that they had known a beast die in consequence of having eaten the leaves of the yew, from growing trees or hedges *.

The yew is certainly admissible on the lawn, and in ornamental plantations. It makes an ex-

* Mr Marshall, speaking of this matter, says,—“ It is observable, that, in the extensive yew plantations above mentioned, cattle were admitted with impunity, and still range amongst the stragglers that are left, without any evil consequence. They are browsed to the very bole :—Sheep are particularly fond of the leaves ; and, when the ground is covered with snow, will stand upon their hind legs, and devour them as high as they can reach.”

But notwithstanding of sheep and goats eating with impunity the growing leaves, it would be very unsafe to allow this circumstance to induce us to be careless about their eating its leaves when clipped off.—Mr Hanbury relates a story of seven or eight cattle having died in consequence of having eaten the half dried clippings of a yew tree, or hedge, which a gardener had thrown over the wall ; by which it would appear that the leaves and twigs, when dried or half dried, and when taken into the stomach in considerable quantities, have a very different effect from what they have, when taken in small quantities when green.

cellent, close, effectual, and permanent screen ; and, if properly trained, will rise to a very considerable height. No plant is better adapted for underwood than the yew, it will thrive under the drop of other trees equally with the holly. A grove of yew trees, in a recluse corner, would be a solemn passage in the grounds of a place. As the cypress in the East, the yew in Britain has been appropriated to the decoration of sacred ground from time immemorial. It is therefore a fit accompaniment to the temple and the mausoleum*.

The timber of the yew is very valuable ; but was much more so formerly than it is now. It was of the yew, chiefly, that our archers made their bows ; besides which, Mr Evelyn says,—“ The artists in box, cabinet-makers, and inlayers, gladly employ it :—also for the cogs of mills, posts to be set in moist grounds, and everlasting axle-trees, there is none to be compared with it.”

Mr Marshall mentions a number of yew trees having been cut, in the neighbourhood of Boxhill in Surry, of a very large size ; and that they were

* How much would that grand edifice, the Mausoleum at Castle-Howard, have been improved in appearance, at this time, had the builder of it planted about it some yews and cedar trees ? Certainly this has been overlooked, or neglected, by some accident. Every thing is otherwise done in great style (as it is termed) at this place ; and, certainly, the propriety of connecting this building more immediately with wood of some kind, must have struck the great Howard.

sold to the cabinet-makers, at very high prices, for inlaying; that one, in particular, was valued at a hundred pounds Sterling—the one half of which did actually sell for fifty pounds; and that the least valuable trees were cut up into gate-posts, which are expected to last for ages.

SECTION VI.

ON THE VALUE OF TIMBER, AND THE ADVANTAGES TO BE DERIVED FROM PLANTING.

THAT Timber is of the utmost importance to mankind, both in the savage and civilized state, has been fully exemplified in the history of every quarter of the globe. The foliage of thick forests afforded shelter to the ignorant and naked inhabitants of these Islands at a remote period ; and at this moment, in some parts of the world, the natives have no other shelter. Necessity and experience in due time, taught our forefathers to construct huts of trees, both to defend them from the attacks of destroying animals, and to afford shelter from the inclemency of the seasons. The same powerful agents gradually instructed their children to apply their trees to more elevated and noble purposes ; till, at the present day, they have become, in the form of a triumphant Navy, the means of exalting these Islands to a height of glory unrivalled in the history of the world.

Daily experience teaches us, that Timber is a most necessary, useful, and valuable article in common life. Indeed, without it, we would be near-

ly as destitute as we should be without food or raiment. Timber, therefore, is equally necessary to our private comforts, and to our existence in a national point of view ;—besides, wood is to the country as clothing to the body. By the proper management of wood, the seats of the great are embellished in an eminent degree ; towns and villages are beautified, and our fields are sheltered.

The advantages to be derived from subdividing extensive tracts of barren country by plantations, are evidently great, whether considered in the light of affording immediate shelter to the lands, or in that of improving the local climate. The fact that the climate may be thus improved, has in very many instances been sufficiently established. It is, indeed, astonishing how much better cattle thrive, in fields even but moderately sheltered, than they do in an open exposed country. In the breeding of cattle, a sheltered farm, or a sheltered corner in a farm, is a thing much prized ; and, in instances where fields are taken by the season for the purpose of fattening them, those most sheltered never fail to bring the highest rents, provided the soil be equal with that of the neighbouring fields which are not sheltered by trees.

If we inquire into the cause, we shall find, that it does not altogether depend on an early rise of grass, on account of the shelter afforded to the lands by the plantations ; but, likewise, that cat-

tle which have it in their power, in cold seasons, to indulge in the kindly shelter afforded them by the trees, feed better ; because their bodies are not pierced by the keen winds of spring and autumn ; neither is the tender grass destroyed by the frosty blasts of March and April. But, indeed, shelter is not more useful in cold seasons, than the shade of trees is gratifying to cattle in hot ones. In an exposed, open field, under a burning sun, the torture which cattle often endure is truly distressing.

It may be argued, that the desirable effects of shelter and shade may both be obtained by simply planting single rows of trees in the division lines, or around the sides of fields. This is granted, in many cases, where the land is good ; but in situations more exposed, even with tolerably good soil, the rearing of single trees is a matter of great difficulty. But it may justly be said, that, even in the best of lands, by planting a stripe or belt of a moderate breadth, and keeping the fields of a good size, there would not, ultimately, be any ground lost to the purposes of husbandry. When the trees were past being injured by the browsing of the cattle, the fences might be thrown open ; and, the plants being properly thinned out, the pasturage under them would be found early, and the shelter and shade most valuable. Even the corn farmer, in many instances, might be very much bettered by planting. Whether his farm be

situated on the plain, or on the side of a hill, if destitute of wood, it is pronounced, by common consent, a bare cold looking place. Certainly a spirit for planting has other objects in view than that of increasing the quantity of arable ground. —All that we propose is to advise the making of useful plantations: And he is surely a shortsighted proprietor, who would grudge the planting of such a part as shall evidently benefit the rest by a moderate and convenient shelter,—even supposing the lands to be, what rarely can happen, solely appropriated to tillage; for, surely, under good management, in many cases the arable farmer must occasionally become a feeder, and then he must necessarily be sensible to the good effects of planting in common with the breeder and grazier, as in the cases adverted to above.

It is very generally known, that such estates as have a quantity of well arranged, healthy timber upon them, when brought to sale, bring an extra price, according to the quality and value of the wood, not only at the time of sale, but, counting forward on its value, to the period of its perfection. Thus, supposing the half-grown timber on an estate to be valued at ten thousand pounds at the time of the sale, instances are to be found where thirty thousand pounds have been given, over and above the valuation of the lands.

The purchasers of such estates wisely foresee the increase of value which will arise from healthy timber growing, where it may not only be che-

rished till of full maturity, but where, probably, it can then be turned to the best advantage, by reason of its local situation. But besides the real value of grown timber, there is most generally an ideal value attached to it, namely, that of its ornamental appearance.

The actual profits arising from planted timber we have known, in several instances, to be very great; and, probably, in none would it sink, in eighty or a hundred years, below what could have been procured from the land in name of rent, provided the trees be well managed. One instance lately came under our observation, where a plantation of an acre and a half of sycamores, of 60 years standing, was offered to be purchased, at the rate of L. 14 *per acre per annum* since the time of planting!—and, perhaps, this same land would not, at an average, have rented at 30s. *per acre per annum*! Other instances might be adduced, where the profits of planting have been remarkably conspicuous. These profits, however, must vary, in every county and district of the kingdom, according to the quality of the soil, local circumstances, and the like. Every proprietor who has ever cut an acre of timber, or of underwood, and who has rightly considered the value, for a given time, of an adjoining acre of the same quality, which has been employed in agriculture, and has experienced an ordinary manage-

ment, must, in some measure, be satisfied of the relative value of a crop of trees*.

The importance, however, of planting, and of cultivating the timber which is already planted, as adverted to in the Introduction, must appear so manifest, and is an employment at once so reasonable, so profitable, so pleasing, and so honourable, that it carries its own recommendation along with it: it barely requires to be hinted to the lover of his country.

* See Tables of the value of timber in Appendix.

JANUARY.

THE
KALENDAR.

January.

THE NURSERY.

OF LAYING OUT A NEW NURSERY.

WITH respect to the proper situations and soils for a Nursery, we have been particular in Sect. I., to which we beg leave to refer the reader. We have also noticed the methods of fencing, and of subdividing the ground by breaking hedges; and the necessity of effectually draining it of stagnant and superabundant water.

If the weather be open, and the ground be moderately dry, this is a very proper season for trenching; an operation very generally indispensable in the laying out of a new Nursery. In this business, much precision is necessary. In ordinary cases,

it will be proper to trench the ground to its full depth, supposing the upper soil or vegetable earth to be about twenty inches or two feet deep; but in no case is it proper to trench up crude, unimproved soil, in the preparation of a seminary. Indeed, nothing could be more fatal to the raising of seedlings, or even to the nursing of them when raised. For the first purpose, it is important that the soil be rich, mellow, and very fine; and for the second, that it be at least mellow, and homogeneous.

In the trenching, therefore, it will be necessary to observe to turn up none of the subsoil, or poor under stratum; and to be particular in making the trenches of an equal breadth and depth, more especially if the ground be inclined to wetness: for if *galls* be left between them, the water will stagnate below, and very much injure the crop. To prevent the ill effects from accidental galls, it will be advisable to make the trenches, in the direction of the declivity, lengthwise of the ground, and the water will find its way along the subsoil, to the lowest edge of the field or quarter. If the ground be broken out from the ley, the turf should be well broken, and be buried in the bottom; and in any case, as, if it be stubble ground or the like, the soil should be well mixed, and be made fine with the spade. The surface, however, at this time, should be left rough, that it may be rendered the finer by the action of the weather, before being cropped.

It will very rarely happen, that ground broken out, either from ley or stubble, can be in fit condition for tree seeds, especially of the finer and more delicate kinds, the same season. The best preparation is a light fallow crop of esculents; such as lettuce, spinage, or turnip. Potatoes, we may remark, should never precede tree seeds. The ground should be well manured for such crops, and often hoed in the course of the season, in order not only to clean, but to meliorate and render it fine. When such crop comes off, the ground should immediately be ridged up, that it may be still further meliorated. It may be fit to be sown by autumn or spring, according to the kinds of trees to be raised; but if it lie over winter, the ridges should be again levelled in November, in order to give the ground a new surface.

Even for the reception of seedlings, such a process as the above is commendable; although, if the ground be in pretty good heart, they will succeed very well after sufficient trenching and a winter fallow. In cases, therefore, where it is not intended to prepare the ground by an esculent crop, it should be trenched the earlier—before winter.

It is hardly necessary to remark, that in laying out a Nursery, whether simply as such, or as a field-garden and nursery combined, it will be proper to have a broad walk, or cartway, to pass through the ground, and perhaps also to cross it,

besides the necessary alleys round the fences, and between the quarters, in order that manure may be the more readily carried in, and the crops carried out. This road or walk may be grass; but, if metalled and gravelled, it would give less trouble in keeping.

We have observed that the ground should be fenced in such a manner, as to exclude hares and rabbits. With this view, a wall appears to be the most immediate and effectual fence. A small sunk fence, with a hawthorn hedge at top, may answer very well, and may be found advantageous in cases where much draining is requisite. If a hawthorn hedge be planted on the plain surface, it will require to be close paled, and to be kept so for several years, and, of course, will be very expensive. Few growing hedges will exclude rabbits, unless guarded at bottom by pales, or by a footing wall. The gates of the nursery should be close, at least at the bottom part, and should be substantially hung.

OF DIGGING AND TRENCHING VACANT GROUND, &c.

In an established Nursery, whether simply so, or occupied partly as a kitchen garden, there necessarily will, by this time of the season, be many spots cleared from the crops of last year. If these have not yet been trenched, digged, or ridged up,

it should now be done without delay. Ground which has been ridged in September or October, should now be levelled; and ground, which was then digged plain, should now be ridged up. Nothing is more important in the seminary, than a working of the soil when out of crop. Although, in most cases, it is proper that it be moderately rich, it is of greater importance, in any case, that it be *very fine*, than *very rich*. It is not advised, however, that this work be carried on in wet weather, or in time of snow, or when the ground is in a state which may be termed wet; at which time it would, indeed, be very prejudicial.

OF DIGGING THE ROWS OF NURSERY STANDING
OVER YEAR, TAPPING THE ROOTS,
AND PRUNING THE PLANTS.

This is a most necessary duty towards plants which are to remain in the Nursery lines for one or more years longer. If the ground be moderately dry, this is a proper season for performing the work of digging between the rows; if not, it may be deferred till next month.

Previous to digging between the lines, the plants should be gone over, and pruned of their strong *competing* branches only, if not previously performed in the autumn months. A leading shoot, of the most promising appearance, should be singled out, if possible, for each plant; and a number of

the small twigs should be left regularly disposed on the stem, in order to detain the sap, and to make it circulate more equally through the whole plant. It will seldom happen that it would be improper to cut off all the competing branches from a nursing; but in some cases it may be proper to shorten some of them only. The above is to be understood of the deciduous, or hard wood kinds: the fir kinds, while in a state of nursing, will require nothing more than the removal of one of their leaders, when they happen to have two, which will very seldom be the case. When it does happen, however, the strongest of course should be left: Barely pinching off the top of the weakest with the finger and thumb, is perhaps the best method of pruning in the present case.

Two-year seedling Oaks, Chesnuts, Walnuts, or Beech, which have been sown in drills, and which are intended to remain for another season in their present situation, should, together with such of the same kinds as have already stood two seasons in the lines, and which are intended to remain another season longer, be *tapped*; that is to say, their tap roots should be cut about eight inches below the surface*. This is most effectually and readily done by two men with sharp spades;

* This method of treating two-year seedlings, is only admissible in cases where there is too much labour to be performed. Lifting the plants entirely, and replanting them, is far more preferable; because it is more in our power to

one *rutting*, or cutting the ground obliquely with their spades, on each side the line at once, and exactly opposite to each other. After this operation has been performed, the plants should be made firm, by a person treading the rows with a foot on each side. These kinds, so tapped, will, in the course of the following season, in consequence of being thus root-pruned, or *tapped* as it is called, push many more fibres on the upper part of their roots, than they otherwise would have done; and thus will the plants be better fitted for being transplanted into shallow soils, or indeed into any soil, than they would have been by being allowed to remain in the ground untapped till the time of lifting.

The interstices of all rows intended to stand another year, should be neatly pointed over with a narrow spade; or, if the roots be much matted, (as is the case with several kinds), a small three-pronged fork is to be used; taking care, by all means, not to injure the fibrous roots if possible. It need hardly be noticed, that the ground should be cleaned of all loose twigs, and grass or other weeds, before the operation of pointing with the fork.

prune and treat them properly, when lifted, than otherwise.

In the other case, the trees should have been planted out in the forest at the age of two years transplanted, but would probably be very much the worse for remaining in the lines another year without being tapped.

OF LIFTING PLANTS FOR PLANTING OUT.

Where the scene of planting is extensive, and perhaps even in other cases, that business may now be going forward (except evergreen or fir kinds, which should stand in the lines till the season of planting). Plants, of course, will be required from the nursery, perhaps daily, or it may be weekly. It is of very great importance that they be taken up with care; especially the lank-rooted or fibreless kinds, as the Oak and the Beech. We have known many thousands of fine plants ruined through inattention to this matter.

If they have been planted by the dibble, it is no matter on which side the plants be loosened by the spade; but if they have been *laid*, it is necessary to loosen them on the side which was solid at laying, otherwise you will be sure to cut off many of the most fibrous and best roots. In the loosening of plants, which have stood in the rows two years, as the Oak, Beech and Sycamore, which root perpendicularly and deep, if the spade be much sloped in thrusting it down, the main root is apt to be cut asunder, perhaps too high. And if these kinds, and some others, be not fairly undermined by the spade, their roots may be torn and injured in the pulling up, to the great detriment of the plants. Resinous trees are least troublesome in the lifting, as they root shallow, and are generally very fibrous.

Trees which have been in training several years, for the park, the lawn, or for hedge-rows, and which stand at good distances, should be lifted in the manner of fruit trees ; that is, by throwing out a trench on one side, fully to the depth of the roots, and then putting in the spade on the opposite side, so as to get below all the roots, and then heeling the plants fairly over to one side. In lifting plants from the nursery, they should be shaken as little as possible ; the more earth they carry with them to the field, the more will their progress be insured.

OF PRUNING NURSERY PLANTS BEFORE PLANTING,
&c.

While these trees, both young and old, are in the hand, at least before they be planted, they should be pruned. Many people pay no attention to this matter, but put in the plants, of all kinds and sizes, without touching them with a knife ; which is extremely wrong, and renders many plants very sickly, by allowing too great a proportion of branches to the roots : it is the roots chiefly that support the tree ; therefore, every one of them should be retained, if possible, while the top should be greatly retrenched. Even most of the deciduous kinds which have been previously pruned while standing in the lines, as directed above, will require to have their stems and tops looked over

again, with the view of removing any branch that might have been overlooked, and thus more completely directing the juices into the leader of the plant.

The unmanageable lank roots of some of the kinds may be shortened, but in as sparing a manner as possible, only as much as to allow their being planted in good ordinary sized holes; the very fibrous-rooted kinds, as the Ash, &c. will require hardly any trouble, excepting in cases like the above. In all cases, however, where the large roots have been broken, or much bruised in the lifting, these should be cut into the sound part of the root with a sharp knife.

If trees are daily lifted for the planters, it will be proper to cover them over with mats while lying for the operation of pruning, that they may not be too much exposed to the air; and if they are to be sent off to short distances, once in two or three days, loosely in carts, it is obvious, that they must be *shoughed*, or laid into the ground by the roots; but if they are to be carried to a great distance, they must be carefully packed into mats, so as to secure them against the severities of the weather, to which they otherwise might be exposed, greatly to their hurt. It is also necessary that all the plants which have to lie any time at the field of planting, be *shoughed*, the better to secure and protect their roots from injury.

OF GATHERING FIR CONES.

Now is a proper season to collect Larch cones. Be careful to gather only from such trees as appear to have ripened their seeds. These can easily be ascertained, by cutting the side of one or two cones taken from the tree: Cut in as far as the seat of the seeds; if three or four good seeds are found in the side, they are prime cones. After gathering, they should be laid upon a dry loft, till the season of taking out the seed arrive. Scots and Spruce fir cones may also now be gathered, and preserved as above advised for the larch. It is of great importance in the securing of a crop of any of the fir tribe, to have the seeds taken out of the cones as near to the time of sowing as possible. The seeds will keep good in the cones for a year or two; but after being taken out they spoil, and will not grow, after a few months keeping.

ORNAMENTAL PLANTATIONS.

Under this head, we shall consider all plantations near a residence which may be termed both ornamental and useful ; as groves, screens, masses, detached trees, hedge-rows, stripes for the division of the farm, &c.

ON PREPARING THE GROUND FOR GROVE OR SCREEN PLANTATIONS.

The preparation of the ground, for any sort of plantation, is a matter of much importance. According to the qualities of the soil, and the manner in which it is prepared previous to planting, we afterwards perceive the good or the bad effects of management on the plants. A middling soil, well prepared, will often produce better growths, for several successive years, than a good soil which has been prepared in a superficial manner. In so far as regards plantations of the description under view, it is generally a matter of considerable moment to have them reared speedily ; consequently, we must have recourse to effectual preparation of the ground in the first place : And a choice of fit plants, and a proper method of planting them may secure the desired success.

In many instances, as in the case of rearing an immediate screen, a mass or a grove, placed in a particular point of view, it may be advisable to trench the ground ; in others, perhaps to plough it. But for an ornamental plantation, or indeed any which comes under the present head, it would ill become the planter to content himself with the superficial method of making pits only. If the expence of trenching be thought too much, let the plough be substituted wherever it is practicable. Pitting ought only to be resorted to in places where the surface is steep, rocky, or so stony as that the plough cannot be introduced. On the subject of pitting, therefore, we shall here be silent. The reader will find that subject fully treated of under the head of *Forest Plantations* for May.

To drain where necessary, and to drain effectually, are points of the first importance in the preparation of the soil for a plantation, whether it is to be trenched or to be ploughed :—it is as necessary, and as proper, to drain for timber as for wheat. The species of drain most generally useful in a plantation, is an open or sky drain. The depth should be according to that of the springs, and situated so as effectually to cut them off. Master drains may often be conducted in such a manner as to form, at the same time, the fence, or a part of it, especially if executed in the sunk-fence manner. If surface water only is to be carried

off, small open cuts, or good plough furrows, conducted into the master drains, will generally be found to dry the surface completely. Rubble drains are improper in plantations; being liable to injury and stoppage by the roots of the trees. If it be necessary to conceal a drain in an ornamental plantation when it passes near to a walk, or might be thought a nuisance, it should be built on the sides, paved above and below, and covered over with earth.

In trenching of the ground for a grove, screen, or other ornamental plantation, if the soil be any thing less than twenty inches deep, it may be said, in general, that it should be trenched to its full depth. The depth, however, of twenty inches, or at the most two feet, is quite sufficient in any case. In instances where the soil is less than a foot in depth, a simple digging may answer; or it may be effectually prepared by the plough and the harrow. Few instances occur in trenching for such plantations where it is necessary to turn up the subsoil. It is always proper, however, to break and mix the earth well in the operation of trenching.

In cases where the soil is thin, and where it becomes necessary, in digging or ploughing, to turn up a part of the subsoil in order to gain depth, it is proper to fallow the land for some months previous to planting. The time, therefore, for such digging or ploughing, supposing it were intended

to plant in February or March, is rather November than January. But we have no hesitation in saying, that if the ground be broke up at this time or in February, by taking a fallow crop of potatoes or turnip, and planting a year hence, there would, with respect to the growth of the trees, be no time lost. If the soil be stiff, and in grass, it may be proper to take first a crop of oats, and then a second of potatoes dunged, previous to planting the trees.

In cases where the ground is to be prepared by the plough alone, and where the soil is deeper than one of the improved Dalkeith ploughs can reach, it would be very proper to make one plough follow another in the same furrow ; by which means the soil may be stirred fully a foot in depth. This operation, it must be remarked, cannot, however, be so well done in the breaking of ley ground, as in stubble or open surface. If the ley were reduced by a crop of oats or potatoes, the land might be effectually prepared in this manner in autumn and winter. In all cases, it is obvious, that where the soil is only so deep as that the plough can, in this manner, command it, this must be the cheapest mode of preparation. The crop of grain, or of roots, would certainly cover every expence.

In cases where the land is trenched or dug, it should be left rough, in order to increase the surface as much as possible ; and in cases where it is

ploughed, it should lie in the furrow for some time before being harrowed down; all in order that it may be better meliorated by the action of the weather. After planting, we would propose farther meliorating it by green crops, and by the use of the spade and the hoe for several successive years: Of which melioration, by these means, see *April* on this head.

ON PREPARING THE GROUND FOR USEFUL STRIPES,
&c.

In preparing the ground for useful stripes for the division of the farm, or the division of extended tracts of bleak country, intended to be cultivated, the methods followed must, according to circumstances, either fall under the above head, or under those to be recommended for Forest Plantations in *May*; of which much remains to be said.

OF PREPARING THE GROUND FOR DETACHED, AND
FOR HEDGE-ROW TREES.

Plants for this purpose are generally put in of a much larger size than those for the grove or the mass. Being placed at a considerable distance from one other, they are of course planted in prepared pits or holes, suitable to their respective sizes. Such plants are nursed and removed at a very con-

siderable expence ; and it accordingly becomes necessary to bestow a corresponding degree of pains in the preparation of the soil for them.

In cases where the soil is light, deep, and remarkably rich, the least care will be necessary ; and in cases where it is stiff, thin and poor, the more care will be requisite in the preparation. In the former case, it will generally be sufficient to form the pit, a few weeks before planting, of a width and depth corresponding with the size of the roots of the plant, keeping it fully large however ; whereas, in the latter case, the better part of the surface-earth should be taken out, and laid by itself, in order to be mixed with the better soil to be brought. The pit should then be made three or four inches deeper and wider than necessary to hold the intended tree ; and the crude soil taken therefrom should be rejected. The space dug out should be filled up with the good soil brought ; or at least three or four inches of it should be laid into the bottom of the hole. The rest should then be intimately mixed with the better surface-earth dug out as above ; reserving as much of it unmixed as will serve to cover the small fibres of the plants, along with that put into the bottom of the pit.

It may be proper to remark here, that, according to the poverty of the soil, and the exposed nature of the situation, the plants should be proportionally small. It is seldom advisable to plant

trees more than ten feet in height, in any situation. In such a soil and situation as that alluded to above, plants half that height would succeed better. The expence of preparing the soil for them would be infinitely less than for plants of eight or ten feet in height ; whose roots, of course, would be large in proportion, and would require a very great quantity of fresh rich earth, in which to plant them properly.

In cases where the soil is of a medium quality and depth, between the extremes noticed above, it is obvious that a medium is to be observed in the preparation of it. In some instances, the soil may not be sufficiently deep ; and yet, by collecting a little from the surface around, it may soon be made so, without, perhaps, disfiguring the ground. One thing ought to be observed in every instance, namely, that whatever soil is brought from a distance, it should be of a quality decidedly superior to that on the spot ; otherwise the labour of carrying it will, in a great measure, be thrown away.

There can be no rule laid down with respect to the distance at which to plant detached trees, nor, indeed, with respect to arrangement.

With respect to the distance at which hedge-row trees should be planted, we think twenty feet, in the first instance, near enough. When they are half grown, they may be thinned out alternately, and would then stand at forty feet apart.

If the fence by which they are planted be a wall *, they may be set at fifteen feet apart, or even nearer ; as, in that case, they could not injure the fence.

OF PLANTING ORNAMENTAL PLANTATIONS.

In very few instances will the grounds to be planted, be at this season in a state for receiving the plants : planting when the land is in an improper state for it, is sure to entail destruction on the plants. If, however, any of the ground be dry enough, young trees may now be planted, both in the grove, the mass, the stripe, and in the hedge-row ; but as the next month is a more proper season, we shall defer our particular directions for planting till that time, which see.

OF PRUNING ORNAMENTAL PLANTATIONS.

THIS subject will naturally arrange itself under the respective heads into which we have divided

* If it be a fruit-wall, however, care must be taken not to plant the forest trees too near to it ; because their roots will rob the fruit-trees of their nourishment, and probably kill them entirely. Many instances of the baneful effects of forest trees being allowed too near fruit walls, might be adduced ; but this is not the proper place for such a discussion. Forest trees should never stand nearer a fruit wall than forty feet ; and more especially if they be ash trees, which should not be nearer than a hundred feet.

ornamental plantation ; as groves, masses, stripes, hedge-row, and detached trees and groups ; together with screen plantations. While all these are professedly for ornament, we shall endeavour to study utility, in directing the operation of pruning ; and we shall treat of the pruning of each species of plantation separately. It must always be kept in mind, that pruning is a matter of the highest importance, both to the health, the vigour, the beauty, and the utility of timber and ornamental trees.

PRUNING OF GROVES OF DECIDUOUS TREES.

The professed object, in this case, is to acquire tall, clean stemmed trees. This end cannot be attained without thick planting, and also a considerable breadth of it. Yet these alone would never accomplish it without the aid of judicious pruning.

The pruning of groves of deciduous trees, must be commenced the first year after planting ; and will at that time consist in removing every branch competing with the leader for the ascendancy ; and thinning the smaller side shoots and twigs on the boles of the plants ; leaving a sufficient number on each to promote an equal distribution of the sap over the whole plant. The same attention to these will be annually required,

till they arrive at maturity. Care must always be taken, that the tops be neither too much lightened nor left too thick : The proportion which the top of a grove tree, from twenty years old and upwards, should occupy, is about a third part of the height of the plant ; thus if the tree be thirty feet high, the top should be ten feet. But in infancy, grove trees should be feathered from the bottom upwards, keeping the tops light and spiral, something resembling a young Larch. A figure of such a tree, eight years of age, will be found in Plate I. fig. 3. The proportion of the tops should be gradually diminished, year by year, till about their twentieth year, they come to bear the above proportion to the size of the plants. In cutting, or pruning off the branches, the utmost care must be taken not to leave any stumps sticking out, but to cut them in to the quick. It is only by this means that clean timber can be procured for the joiner ; or sightly smooth-stemmed trees to please the eye.

In regard to Fir or Larch nurses in grove plantations, they should not be removed, nor perhaps pruned, till their seventh or eighth year. Excepting when necessary to remove any competing branch, or such as bear too large a proportion to the bole, they should not be pruned before this age ; and wherever such occur, they ought to be removed entirely by the bole. The top of no Larch, at any period of its growth, should be al-

lowed to be too crowded with lateral branches. In every case where this happens, they should be thinned out, to prevent its getting top heavy ; being careful never to remove a great proportion of them at once. Those intended to be left, should be pruned with very great caution ; a tier, or at the most two tiers of their undermost branches, should be removed the first year of pruning ; and so forth annually, till their top bear the same proportion to their height, as is recommended above for the hard wood. The same care to cut clean by the bole, must be observed in the case of Firs and Larches, as is recommended above for the hard wood.

In the pruning and thinning of a grove plantation, care must be had not to make it so thin of trees on the skirts, as in the interior, nor to prune the *nurses* situated on the edges of the grove so much as more inwards. Many of the Larches, and, perhaps, the Silver firs upon the skirts, should be left quite feathered from the bottom upwards, to give the grove a clothed and massive air. This precaution is especially necessary, till it arrive at its twentieth or thirtieth year.

PRUNING LARCH AND FIR GROVES.

It has been hinted above, that Firs should not be pruned at so early an age as the deciduous or hard wood kinds. The pruning of a Larch grove

should be commenced about its sixth or eighth year, according to its strength or vigour. No more than one or at the most two tiers of branches should be removed at once* ; otherwise these trees might be much injured. The size of the tops should be gradually diminished, as recommended for the nurses in the preceding article, till they are in the fore-mentioned proportion, which proportion must be continued to the end. The pruning of Firs has been much spoken against; and, as is but too common, one has followed another, until ignorance has made it fatal to the trees. The noble and learned Earl of HADDINGTON, who practised it nearly 100 years ago, had not only experienced its good effects, but proposed to carry it to a greater length than we would advise. His words are ; “ I was once a great enemy to the pruning of firs, because what came from Norway never had met with that treatment; but now I think, when the side branches are taken away when they are young, there can be no harm in it ; for the bark will soon grow over the wound, and so

* Three years ago we knew a gentleman remove five or six tiers of branches from a good number of Larches from fifteen to eighteen feet high ; and although it is now three seasons since it was done, the trees still exhibit a pallid and sickly appearance, and probably they will never resume their wonted vigour. Those in the same plantation which escaped the fury of the dummer, are as green and vigorous as can be desired.

no knot can be without that part; for fir never puts out side branches after they have been once cut off. What I propose is, that after it has been set out for good for three years, to begin and cut away two stories or tiers of branches. By this means, and every year cutting away one tier, you'll never have above three tiers on a tree that is designed for timber."

The skirts of the Larch grove must not be either so much pruned or thinned as the interior, at least for a great while of its infancy.

Fir Groves require the same treatment with Larch Groves in regard to pruning, save in the case of the Scots Fir, which is apt to put forth strong and rampant side-branches on the skirts of the plantation, which must be timeously attended to and reduced within proper bounds.

PRUNING OF MASSES.

This species of plantation is more nearly allied to general forest plantation, than the preceding. Nevertheless, the foregoing observations in respect to pruning, will apply equally to it. If it be a mixture of Hard-wood, Larch, and Fir, these respective kinds must be individually treated as above directed. And the skirts of the mass, and more especially the margin most to windward, and to the view, must be kept thick, and least pruned.

PRUNING OF BELTS AND STRIPES.

The pruning of stripes, or narrow belts, is one of the most difficult parts of the forester's employment. He may go on well enough for perhaps ten or fifteen years; but afterwards these narrow stripes become naked and bare. Indeed stripes should always, if possible, be of some considerable breadth, and then their treatment would approach more nearly to that of masses, or ordinary forest plantation: The only difference in this case would be, that they should be rather less pruned, and especially on the skirts; the heads, although pruned into a spiral form, should be left proportionally longer or better feathered than above recommended for masses and groves.

PRUNING SCREEN PLANTATIONS.

Screen plantations are, as implied in their name, intended either to shelter from the wind, or to cover some disagreeable object from the view. Screen plantations, therefore, are generally furnished with a stock of underwood, such as Holly, Yew, Laurel, Spruce, Hazel, or Furze, or a mixture of all these, according to circumstances.

The pruning of the principal or timber trees in the screen plantation, may be considered as already pointed out; save only, that their heads

should be kept longer than those either of the grove or mass trees ; or, like those above recommended for trees on the skirts of narrow stripes or belts. The underwood should be encouraged to rise up to their respective proper heights, not by pruning them, (for they should not feel the knife), but by removing the shadowing branches of the principals, as much as the circumstances of the case will allow. Part of the principals, as Spanish Chesnut, Elm, Poplar, or the like, which are more than necessary, may be cut over by way of pollards, to complete the screen where wanted. A screen plantation should be, from top to bottom, one continued hill of leaves and branches ; beginning, at the edge or skirt, with the most dwarf growing kinds, and receding with the taller growing, till they mix their branches with those of the principals. Both sides of a screen plantation may be so managed ; and, when thus managed, it is rendered the most effectual screen.

PRUNING HEDGE-ROW TREES.

Hedge-row trees, especially such as are planted in arable fields, although planted principally for ornament, should be pruned with more attention to length of stem, than single trees which are planted in the park and in the lawn. It is a galling thing for the corn-farmer to be interrupted by the pendulous branches of the Beech, or the

Elm, in his operations in the field. To the grazer, however, such a circumstance would rather be an advantage. Yet such trees, at any distance, want all the character of large trees, appearing rather like great bushes ; and consequently they can seldom be accounted beautiful in the situation of hedge-row trees. Those hedge-row trees which we have known to produce the most pleasing effects, have their tops in proportion to their whole height, as two to two, or as four to five. Thus, if the tree be forty feet in height, the stem should be from twenty to twenty-four feet ; while the top should be from eighteen to twenty feet in height. The tops of hedge-row trees should be allowed to express the general character of the kind : it would be formal and inelegant, to force the Sycamore and the Elm to show the same character of top. The former will grow more upright and compact, while the latter will be more open and straggling.

The tops of grown up hedge-row trees should not be allowed to take too great a breadth ; neither should they be too much retrenched ; no competing limb which might endanger the health of the plant should be allowed. The difficulty, or ease, of pruning hedge-row trees of the above description, will depend on the kinds which are planted. The Scots Elm will give more trouble than the English Elm ; the Beech more than the Sycamore ; the Ash and the Oak, in their proper soil

and situation, will need but a moderate attention.

Hedge-row trees must be pruned from the time of planting, onward ; in the manner directed for deciduous trees, on the skirts of narrow stripes. The leader must be encouraged ; yet the branches composing the top must be numerous, and occupy a greater proportion of the height of the plant, than those in thick plantations.

PRUNING DETACHED TREES IN THE PARK.

The relation of detached ornamental trees in the park or the lawn, to hedge-row trees, is very intimate ; only the variety of figures which trees may be allowed to assume in the former situation, is much greater than can be admitted in the latter. In the park, or the lawn, we may have a Lime tree forming a hill of leaves in summer ; and adjoining, perhaps, a stately Ash, or a noble Oak or Beech, lifting its lofty top high into the heavens.

The methods of pruning these must vary according to the effect which they are intended to produce.

PRUNING GROUPS OF TREES.

The pruning of groups must be regulated by the effect intended to be produced ; each kind of

tree should express its character, yet so tempered by its neighbour, that they may appear like a whole. Where there is no mixture of kinds, the management is less difficult.

FOREST PLANTATIONS.

OF PLANTING.

If the scale be extensive, and supposing the ground to have been prepared, as directed, in the summer months, and if the weather be open and dry, this is a fit time to plant. In an extensive plantation, it will hardly happen but there will be a variety of soil,—some parts moist and heavy and others dry and light. The lightest parts may be planted at this time ; and the more moist, or damp parts, next month, or in March. It must be observed, however, that if the ground be not in a proper case for planting, the operation had better be delayed. The plants will be injured, either by being committed to the ground when it is in a sour and wet, or in a dry parched state. At a time when the soil may be termed neither wet nor dry, the operation of planting is most successfully performed. The mould does not then adhere to the spade, nor does it *run in* ; it divides

well, and is made to intermingle with the fibres of the plants with little trouble ; and in treading and setting the plant upright, the soil is not worked into mortar, which it necessarily must be, if in a wet state, evidently to the great detriment of the plants.

It is therefore improper to plant on a retentive soil in the time of rain, or even perhaps for some days afterwards ; or after a fall of snow, until it has for some days disappeared. Whereas, on a dry absorbent soil, it may be proper to plant in the time of gentle showers, immediately after heavy rains, or as soon as the snow is dissolved.

If the ground has been prepared by pitting, the distances at which to plant will of course be defined. If not, it may be proper to remark here, that in very exposed situations, with a thin soil, the plants may be put in at three, to three and a half feet apart ; and in better situations, from four to five feet distance, according to circumstances of soil, shelter, and the like.

With respect to the size of the plants, that must, in some measure, depend on their kinds ; but it may be said, generally, that, for the purpose under present view, the plants being transplanted, (not seedlings), they should be from a foot to eighteen inches in height, stiff in the stem, and well rooted. Plants for this purpose should seldom be more than three years from the seed ;—indeed never, if they have been raised in good soil.

Many of them may be sufficiently large at two years from the seed ; and if so, are to be preferred to those of a greater age, as they will consequently be more vigorous and healthy.

The Larch, if properly treated, will be very fit for planting out at two years of age. A healthy seedling being removed from the seed-bed at the end of the first year, into good ground, will, by the end of the second, be a fitter plant for the forest, than one nursed a second year. The next best plant for the purpose, is that which has stood two years in the seed-bed, and has been transplanted for one season. This is supposing it to have risen a weakly plant ; for, if the Larch rise strong from the seed the first season, it should never stand a second in the seed-bed.

The Ash, the Elm, and the Sycamore, one year from the seed nursed in good soil for a second season, will often prove sufficiently strong plants for the purpose here in view. If they be weakly, they may stand two years in the seed-bed ; and then being nursed one season in good soil, will be very fit for planting out in the forest.

The Oak, the Beech, and the Chesnut, if raised in rich soil, and well furnished with roots at the end of the first year, and having been nursed in rows for two years, will be very fit to be planted out. But if they be allowed to stand two years in the seed-bed, and be planted one year in good ground, they will be still better for the forest, and

the roots will be found well feathered with fine small fibres *.

The Silver Fir, and Common Spruce, should stand two years in the seed-bed. If transplanted into very good soil, they may be fit for being planted out in the forest at the end of the first year; but, more generally, they require two years in the lines. The Scots Fir should also stand for two years in the seed-bed, and should be nursed in good ground for one year; at the end of which, they will be much fitter for being planted in the forest, than if they were allowed to stand a second year in the lines. They are very generally taken at once from the seed-bed; and, in land bare of heath or herbage, they succeed pretty well; nevertheless, we would prefer them one year nursed.

It will be unnecessary, for the present purpose, further to enlarge on the age or size of the plants. The above are the hardy and most useful forest kinds; and, from the observations made, whatever

* The Earl of Haddington, when writing to his grandson respecting planting, says of the Oak, "I propose in the February, after they have stood two years (in the seed-bed), that they should be planted out for good and all. I thought this had been a notion of my own, but since I began to use this method I saw a wood planted by a gentleman after this manner, that was in a very thriving way." Any person who may be disposed to doubt the success of this method, has only to walk to Binning Wood to be cured of his incredulity.

respects the age or size of other kinds, may easily be inferred.

The next consideration is the arrangement of the kinds. We are clearly of opinion, that the best method is to plant each sort in distinct masses or groups, provided the situation and quality of the soil be properly kept in view; (see particularly the second and fourth Sections on this subject)*. There has hitherto been too much random work carried on with respect to the mixture of different kinds. A longer practice, and more experience, will discover better methods in any science. That of planting is now widely extended; and improvements in all its branches are introduced. We, therefore, having a better knowledge of soils, perhaps, than our forefathers had, can, with greater certainty, assign to each tree its proper station. We can, perhaps, at sight, decide, that here the Oak will grow to perfection,—there the Ash,—and here again the Beech;—and the same with respect to the others.

If, however, there happen to be a piece of land of such a quality, that it may be said to be equally adapted for the Oak, the Walnut, or the Spanish Chesnut,—it will be proper to place such in it, in a mixed way, as the principals; because each sort will extract its own proper nourishment, and will have an enlarged range of pasturage for

* Page 28. *et seq.*; and 49. *et seq.*

its roots, and consequently may make better timber trees.

Although, by indiscriminately mixing different kinds of hard-wood plants in a plantation, there is hardly a doubt but that the ground will be fully cropped with one kind or other; yet it very often happens, in cases where the soil is evidently well adapted to the most valuable sorts, as the Oak perhaps, that there is hardly one oak in the ground for a hundred that ought to have been planted. We have known this imperfection in several instances severely felt. It not unfrequently happens, too, that even what oaks, or other hard-wood trees, are to be met with, are overtopped by less valuable kinds, or perhaps such, all things considered, as hardly deserve a place.

Such evils may be prevented by planting with attention to the soil, and in distinct masses. In these masses are insured a full crop, by being properly nursed, for a time, with kinds more hardy, or which afford more shelter than such hard-wood plants.

There is no rule by which to fix the size or extent of any of these masses. Indeed, the more various they be in size, the better will they, when grown up, please the eye of a person of taste. They may be extended from one acre to fifty, or an hundred acres, according to the circumstances of soil and situation: Their shapes will accordingly be as various as their dimensions.

The kind of nurse most decidedly fit for the purpose under consideration, is the Larch ; unless, as mentioned before, the site be exposed to the sea air, or the plantation in question be the sheltering zone of an infant forest ;—in either of which cases, the Scots Fir, the Elder, and the Sycamore, should take precedence, or, at least, be freely planted, as circumstances may direct.

The distances at which hard-timber trees ought to be planted, are from six to ten feet, according to the quality of the soil, and the exposed or sheltered situation, as noticed above. When the first four oaks are planted, supposing them at right angles, and at nine feet apart, the interstices will fall to be filled up with five nurses, the whole standing at four and a half feet asunder. When sixteen oaks are planted, there will necessarily be thirty-three nurses planted ; and when thirty-six oaks are planted, eighty-five nurses ; but when an hundred principal trees are planted in this manner, in a square of ten on the side, there will be two hundred and sixty-one nurse plants required. A Scots statute acre would require, if planted at the above-mentioned distances, six hundred and seventy-six oaks, and two thousand and twenty larches, or very nearly so. The English acre would require five hundred and thirty-six oaks, and one thousand six hundred and ten larches, or thereabouts.

By this calculation, we find, that if the planta-

tion or mass be extended to an acre, the proportion of nurses to the principals will be as three to one, or very nearly so; and this proportion of nurses to the principals, will hold when the latter are placed at six or twelve feet apart, as well as at nine.

It is abundantly evident, that, if timber trees be planted at six, seven, eight, or nine feet apart, according to the quality of the soil, they are planted close enough to become useful, provided they be nursed up by others for a time. Hard-timber trees are seldom reckoned of much value, until the stem be at least a foot in diameter at the surface of the ground. At the above distances, they might stand till they arrived at that size; but if planted much closer, few kinds would be of use at the first thinning. It is therefore advisable to look to the nurses for a reimbursement of the expence.

If the nurses consist of Larches, this expence will hardly fail to be paid within thirty years after planting; the timber crop of Oak, Ash, Elm, or the like, remaining free. It has been shown, that three larches are required for one oak or ash; and the medium distance at planting has been supposed four and a half feet. At this distance all the larches may stand for ten or fifteen years, or until they would be useful for various country purposes. They might, about that time, be gradually thinned out, excepting one in the centre of the

space between every four oaks, which would thus be placed at the distance of six and a half feet from each of them, and at nine feet each way one from another. These would afford sufficient shelter to the hard timber, and might, in most cases, be allowed to stand until they were twenty-five or thirty years old, and, of course, very valuable for many purposes.

This method of planting is clearly the least expensive, and most effectual of any; especially if, as in some cases which have lately come under our direction, the land be pitted for the principal trees only, and the larches, being small neat plants, be *slitted* or dibbled in. In this way there is a great saving in the price of plants, and in the quantity of labour. In cases where the land can be prepared by the plough, and where the soil is a thin turf, or a dry sand or gravel without turf or rocks, there can be no objection to this mode.

By using the Larch thus plentifully as a nurse, much is evidently to be gained: Perhaps some might not think of planting it in any other character. But the Larch is known to be so very useful and valuable, that it deserves also to be planted in an extensive manner as a *Forest Tree*, where the soil and situation warrant the expectation of its growing to perfection. If the intention be to raise it to large timber, or to its full size, it should be planted in masses by itself, not in mixture with any other tree.

In the same manner ought all the resinous kinds to be planted, which are intended for timber trees ; nor should these be intermixed with any other sort, but be in distinct masses by themselves. The massing of Larch, and Fir of all sorts, is the least laborious and surest means of producing good, straight, and clean timber. It is by planting, or rather by sowing them in masses, by placing them thick, by a timeous pruning and gradual thinning, that we can, with certainty, attain to this object. Larches, and Firs in general, which it is intended to raise in masses, should be close together ; three, three and a half, or at the most four feet, according to soil and situation, will be found sufficient distance ; it being of the highest importance to have them drawn up straight from infancy.

Larches may be planted at this time, or any time between this and the end of March, according to the state of the ground, as before noticed. The planting of all the firs should be delayed till April, or even May ;—to which months we refer the reader.

We shall now proceed to treat of the manual operation of Planting.

If it be determined to plant in Masses, as above recommended, the hard timber should be first planted, and afterwards the nurses ; or, one set of operators may plant the former, while another follows with the latter, provided the nurses be larch-

es ; but, if they be firs, some time must elapse before the season for removing them arrive. The plants, if brought from a distance, should be *shoughed* ; or they may be supplied daily from the nursery, as circumstances direct. All the people employed ought to be provided with thick aprons, in which to lap up the plants ; the spademen, as well as the boys or girls ; the latter being supplied by the former, as occasion may require. All of them should regularly fill their aprons at one time, to prevent any of the plants being too long retained in any of the planters' aprons.

Having mentioned boys or girls, we may here observe, that it is the most expeditious method, and that by which the planting may be best executed, to employ a spademan and a young person together. One man cannot possibly set a plant so well with the spade, unless in the case of *laying*, as two people can ; nor, supposing him to do it as well, can he plant half as many in the same space of time, as two can. A boy ten years of age is equal, as a holder, to the best man on the field, and can be generally had for less than half the money. Hence this method is not only the best, but the least expensive.

By the mode of preparation which will be found recommended in May, the *pit* will now have been dug for several months ; the surface will therefore be incrustated by the rains, or probably covered with weeds. The man first strikes the spade

downwards to the bottom, two or three times, in order to loosen the soil ; then poaches it, as if mixing mortar for the builder ; he next lifts out a spadeful of the earth, or, if necessary, two spadefuls, so as to make room for all the fibres, without their being anywise crowded together ; he then chops the rotten turf remaining in the bottom, and levels the whole. The boy now places the plant *perfectly upright*, an inch deeper than when it stood in the nursery, and holds it firm in that position. The man *trindles* in the mould gently. The boy gently moves the plant, not from side to side, but upwards and downwards, until the fibres be covered. The man then fills in all the remaining mould ; and immediately proceeds to chop and poach the next *pit*, leaving the boy to set *the plant upright*, and to tread the mould about it. This, in stiff wet soil, he does *lightly* ; but in sandy or gravelly soil, he continues to tread until the soil no longer retains the impression of his foot. The man has by this time got the pit ready for the next plant : the boy is also ready with it in his hand ; and in this manner the operation goes on.

In all cases *where the land has been prepared*, whether by pitting, ploughing and pitting, or ploughing and harrowing, the above practice ought invariably to be adhered to.

It borders on absurdity to pretend to plant, by making a gash in tilled ground, and thrusting in

the roots by force ; and this, after all, is probably attended with more trouble than the taking out a spadeful of the earth, and inserting the plant in such a manner, as that the mould may be intimately mixed with its fibres,—a matter of the most evident utility and benefit, whether considered as enabling the fibrils more readily to seek pasturage in the soil, or rendering them less liable to be injured by parching drought. For it frequently happens, that if the soil is moist at the time of planting, in the former case the gash seems to be closed at top, while in fact it remains open ; which is shown by the first succeeding drought, and, if not closed, by the consequent languishment and death of the plant.

On very steep *hangs* which have been *pitted*, the following rule ought to be observed in planting: To place the plant *in the angle formed by the acclivity and surface of the pit* ; and in finishing to raise the *outer* margin of the pit *highest*, whereby the plant will be made to stand as if on level ground, and the moisture be retained in the hollow of the angle, evidently to its advantage.

In proceeding to describe the method by slit, or the T method, as it is commonly termed, we must declare, that we are not advocates for this method of planting, where a better can be pursued. Nevertheless, we would rather see bleak, barren moors, planted by the slit, or indeed in any way,

at the same time more perfectly. But of this afterwards.

We think it proper in this place to remark, that the operation of *planting*, in whatever manner performed, being of the utmost consequence to the immediate and future welfare of the trees, too much care can hardly be bestowed upon it : Nor should he who performs his part *well*, if diligent, be chid for doing too little.

OF PRUNING FOREST PLANTATIONS.

The proper pruning of forest plantations is certainly an object of high importance, both to the proprietor and to the Nation at large, as the quality of the timber much depends on it. Thereby the vegetative powers of the trees are directed to, and continued in their proper channel. The unnecessary waste of their growth is prevented ; and timber of far superior quality, and trees of far greater beauty, are procured.

To secure these advantages, it is however necessary to prune betimes, or rather to commence pruning at the infancy of the trees, and thenceforward to continue it at intervals of one, or at most two years. If the pruning of young forest trees is performed only at intervals of eight or ten years, the growth is unnecessarily thrown away, and wounds are inflicted which will ever after re-

main blemishes in the timber; whereas if the superfluous or competing branches had been removed annually, and before they attained a large size, the places from which they issued would be imperceptible, or at least not hurtful to the timber, when it came to the hands of the artist.

There is no kind of forest-tree but may with propriety be pruned at this time of the year, except the Gean. If this tree be cut now, or indeed at any season, excepting the month of August or beginning of September, it gums exceedingly at the wounds, and is much injured: but if cut at the above season, the wounds become healed over before the winter, and never afterwards gum.

A person who has been properly instructed in the art of pruning, and who is alive to the advantages accruing from a judicious performance of it, can hardly travel a dozen of miles in any direction, without having occasion to lament, and that deeply, the miserably neglected state of the plantations in this country.

How many young plantations do we see, where numbers of the trees are loaded with, perhaps, three, four, or even five competing branches, of a diameter little short of that of the stem on which they grow! These competing branches, when put together, compose perhaps the greater half of the whole top of the tree. Suppose that these be pruned off: Is it not then evident, that the circu-

lation of the juices of the tree must be impeded, that at least a temporary stagnation thereof must ensue, which may, in its consequences, prove highly injurious to the plants? Neither is the injury sustained by checking the flow of the juices, the only one that will probably follow. It is manifest that, by removing competing branches, when they have attained perhaps half the diameter of the trunk of the tree, the *grain* of the *timber* must be abruptly broken over, and consequently, at such places, be less strong than it otherwise would have been. Besides these two evils, there is another of very considerable magnitude, namely, the loss of the solid timber contained in the branches so removed. Is it not evident, that if these branches had been timeously checked, the greater part of the matter forming their solid contents, would have settled in the trunk itself? We have known plantations which have been carefully pruned from infancy upwards, make a better figure at *twelve* years of age, and each tree have more solid wood in its bole, than trees in a neglected plantation of *twenty* years of age. Timely pruning is, therefore, a matter of the utmost importance.

But while we thus inculcate the *pruning* of forest trees, we would, at the same time, deprecate in the strongest terms what, in many instances, bears the name, without possessing a single character of judicious pruning. We have known

men employed as foresters upon pretty extensive estates, who never had any instruction in the art of pruning; and who had not minds sufficient to discern what was necessary, either for the health or perfection of the trees which they were employed to manage, and whose principal qualifications, indeed, seemed to be presumption and strength of body. Under such circumstances, it is abundantly evident, that pruning can never be properly, or even tolerably done, unless the proprietor understand the subject, and himself take the trouble of directing. But, alas! how few do we find, who either understand the subject themselves, or are disposed to be at the pains to understand it,—far less to superintend the operation! In many small places, we frequently find a hatchet put, perhaps, into the hand of some common labourer, (or, it may be, a carpenter, or even a coachman), who is desired to go to such a plantation, and prune the trees. Off he goes, perhaps, with a few superficial instructions, and possibly without any: Whichever be the case, is of no importance: To work he goes; begins at the ground; hacks off every branch and twig within his reach, sometimes close by the bole, sometimes three or four inches from it; and if the trees are small, he not unfrequently cuts them half through, by his awkwardness in missing his aim. If the tree be twenty feet high or more, he has recourse to

another instrument, the long-shafted *chisel*, and with it, pushes his barbarous purpose upwards as far as possible *. He then leaves the tree a woful monument of his strength and his ignorance, in a state infinitely worse than it was before he began to it. It is a thousand to one, if it be divided into two stems at the bottom, if he has not done it the important service of lopping off the best limb, and leaving that which is weakest and worst formed! At all events, he leaves it top-heavy—like a mop on the top of a pole—to be buffeted by every wind; and has mangled and enfeebled its trunk by the infliction of many unnecessary wounds.

But while we mention these barbarous practices, alike disgraceful to the employer and the employed—alike followed with loss to the immediate proprietor and to the nation—we are far from setting down every proprietor, and every forester, as guilty of such reprehensible conduct. We have known in both classes, for many years, persons who not only understood the proper methods of pruning, but practised them, to the manifest advantage of the trees under their care.

It is not, then, here pretended to set forth some new scheme of management, but to call the attention to established principles, which are well known to produce the most beneficial effects.

* Plate I. fig. 2. shows a tree so *pruned*, contrasted with another, fig. 1. (same plate) of the same age, properly pruned.

We have already been particular in our observations on pruning Deciduous grove plantations for the present month. We have shown that the pruning of such trees should commence at a very early period. Indeed, plants should never be sent from the nursery to be planted out in the forest, without having previously undergone, in some measure, the operation of pruning ; as has already been adverted to under the article *Nursery* for the present month. A forest and a grove plantation, as has already been observed, are very nearly allied to one another ; consequently, the same system of pruning recommended for the one, will apply, or very nearly apply, to the other. Indeed, the right pruning of a tree, to the procuring of good, clean timber, must, in every situation, consist in a timely and effectual removal of all competing or superfluous branches. The difficulty of arriving at the proposed end, must increase or diminish, according as the trees are sheltered or exposed ; indeed, the labour and attention necessary to procure clean timber, from a tree planted singly, and exposed, will be found (if at all possible) exceedingly greater than in the case of trees situated in a thick plantation. Hence the propriety of making large masses of planting, where timber is the object. Notwithstanding that we here fully admit the great utility of close masses for the procuring of straight clean timber, it must be obvious to every one, that, for a number of the earlier years

of the forest, however extensive it may be, the plants will not feel that influence from proximity which is necessary to give them the upright tendency or direction that is so highly desirable. Hence the necessity of early pruning of forest plantations. The saying, "Train up a child in the way he should go, and when he is old, he will not depart from it," may well be applied in the present case.

From the importance of this subject, we beg leave here to repeat, that the pruning of all deciduous trees should be begun at the top, or at least those branches which are to be removed from thence should never be lost sight of. Having fixed upon what may be deemed the best shoot for a leader, or that by which the stem is most evidently to be elongated and enlarged, every other branch on the plant should be rendered subservient to it, either by removing them instantly, or by shortening them. Where a plant has branched into two or more rival stems, and there are no other very strong branches upon it, nothing more is required, than simply to lop off the weakest clean by the bole, leaving only the strongest and most promising shoot. If three or four shoots or branches be contending for the ascendancy, they should, in like manner, be lopped off, leaving only the most promising. If any of the branches which have been left further down on the bole of the plant at former prunings have become very strong, or have extended their

extremities far, they should either be taken clean off by the bole, or be shortened at a proper distance from it; observing always to shorten at a lateral twig of considerable length. It is of importance that the tree be equally poised; and therefore if it have stronger branches on the one side than the other, they should either be removed or be shortened.

Thus, a properly trained tree, under twenty feet in height, should appear light and spiral, from within a yard or two of the ground to the upper extremity; its stem being furnished with a moderate number of twigs and small branches, in order to detain the sap, and circulate it more equally through the plant.

Trees of this size, standing in a close plantation, after being properly formed, will require much less attention; indeed, subsequent prunings will mostly consist in keeping their leading shoots single. From the want of air, their lateral branches will not be allowed to extend, but will remain as twigs upon the stem. These, however, frequently become *dead branches*; and if such were allowed to remain at all on the trees, they would infallibly produce blemishes calculated greatly to diminish the value of the timber: hence the impropriety of allowing any branch to die on the bole of a tree. Indeed, all branches should be removed when they are *alive*; such a method, to our knowledge, being the only sure one to make good tim-

ber. From these circumstances, an annual pruning, or at least an annual examination, of all forests, is necessary.

We shall here subjoin a few words with respect to the implements to be used, and the manner of making wounds.

In every case where the *knife* is capable of lopping off the branch in question, namely, in the pruning of infant plants, it is the only instrument necessary. All other branches should be taken off by the *saw*. A *hatchet*, or a *chisel*, should never be used. Every wound on the stem, or bole, should be quite in to the quick, that is, to the level and depth of the bark; nor should the least protuberance be left. The branch to be lopped off by the saw should, in all cases, be notched or slightly cut on the under side, in order to prevent the bark from being torn in the fall; and when the branch has been removed, the edges of the wound, if anywise ragged, should be pared smooth with the knife. If the tree be vigorous, nature will soon cover the wound over with bark, without the addition of any plaster to exclude the air. In cases, however, of reclaiming neglected plantations, an application of this sort may in some instances be necessary, as will be afterwards shown under that head.

But if a protuberance of three or four inches be left, a thing too frequently done, it must necessarily happen, that, before the wound can be cover-

ed with bark, the trunk of the tree at the place must be enlarged four inches on every side, or eight inches in diameter; which may require a period of eight, twelve, or twenty years; and, consequently, the end of such piece of the branch must be rotten long before it can be covered over with bark: a circumstance which must unavoidably occasion a fatal blemish in the wood *. In all cases, therefore, where such protuberances or pieces of the branches have been left, either by careless pruning, or from branches having been broken by the wind, or other accidents, they should be taken clean off, as above advised.

In the shortening of a strong branch, the position of which is pretty upright, it should be observed to draw the saw obliquely across it, in such a manner as that the face of the wound shall be incapable of retaining moisture; and afterwards to smooth the edges of the bark with the knife.

The above observations only respect the pruning of Deciduous trees. In regard to the treatment of Larch and Fir trees, planted in groves or masses (in which situations only they should be planted for timber trees), we have been particular in the preceding article for this month; to which we beg leave to refer the reader. We shall only here observe, that the pruning of these kinds

* See this illustrated in Ash Planks, figured in Plate II.

ought not to be commenced before their tenth or twelfth year; and that only one, or at the most two, tiers of branches should be removed in a season *. These ought to be cut close in to the quick, as advised above for the Deciduous kinds. Too much care cannot be taken never to leave either pieces of the branches so pruned off, or dead branches, upon larches or firs; more especially the Scots Fir, because these trees are more apt to produce dead branches than any of the other sorts generally planted. The leaders, both of the firs of all sorts, and of the larches, should be carefully kept single.

THINNING OUT PLANTATIONS.

The properly thinning out of plantations is a matter of the very first importance in their culture. However much attention be paid to the article of pruning, if the plantation be left too thick, it will be inevitably ruined. A circulation of air, neither too great nor too small, is essential to the welfare of the whole. This should not be wanting at any period of the growth of the plantation:

* Excessive pruning, either of firs, larches, or deciduous trees of any sort, is highly injurious, not only to the health of the plant, but to the perfection of the wood. If a sufficient number of branches are not left on the young plant to produce abundance of *leaves*, perfectly to concoct its juice, the timber will be loose in its texture, and liable to premature decay.

But, in cases where it has been prevented by neglect, it should not be admitted all at once, or suddenly. Opening a plantation too much at once, is a sure way to destroy its health and vigour. A timely, gradual, and judicious thinning, is therefore obviously necessary.

The thinning out of plantations, is liable to restrictions, according to local and relative circumstances; the situation of neighbouring plants; their value; and the value of the plants to be thinned out. These last may be estimated in a twofold view: they may be valuable as useful timber, or as nurses to other trees.

But in *thinning*, the consideration which should in all cases predominate, is, to cut for the good of the timber to be left, disregarding the value of the *thinnings*. For, if we have it in our choice to leave a good, and take away a bad plant or kind; and if it be necessary that one of the two should fall; the only question should be, by leaving *which* of them shall we do most justice to the laudable intention of raising excellent and full-sized timber for the benefit of ourselves and of posterity? The worse tree should never be left, but with the view of filling up an accidental vacancy.

In order to prevent unnecessary repetitions, and that the subject may be the more clearly followed, we shall proceed, in the first place, with the manner of thinning mixed plantations.

OF THINNING MIXED PLANTATIONS.

Here the removing of the nurses is the first object which generally claims attention. This, however, should be cautiously performed; otherwise the intention of nursing might, after all, be thwarted. If the situation be much exposed, it will be prudent to retain more nurses, although the plantation itself be rather crowded, than where the situation is sheltered. In no case, however, should the nurses be suffered to overtop or *whip* the plants intended for a timber crop; and for this reason, in bleak situations, and when perhaps particular nurse plants can hardly be spared, it may sometimes be necessary to prune off the branches from one side entirely. At subsequent thinnings, such pruned or disfigured plants are first to be removed; and then those which, from their situation, may best be dispensed with.

At what period of the age of the plantation *all* the nurses are to be removed, cannot easily be determined; and, indeed, if the nurses chiefly consist of Larches, it may with propriety be said, that they should never be totally removed, while any of the other kinds remain. For, besides that this plant is admirably calculated to compose part of a beautiful mixture, it is excelled by few kinds, perhaps by none, as a timber tree.

But when the nurses consist of inferior kinds, such as the Mountain-ash and the Scots Fir, they should generally be all removed by the time that the plantation arrives at the height of fifteen or twenty feet, in order that the timber trees may not, by their means, be drawn up too weak and slender.

Before this time, it may probably be necessary to thin out a part of the other kinds. The least valuable, and the least thriving plants, should first be condemned, provided their removal occasion no blank or chasm; but where this would happen, they should be allowed to stand till the next, or other subsequent revision.

At what distance of time this revision should take place, cannot easily be determined; as the matter must very much depend on the circumstances of soil, shelter, and the state of health in which the plants may be. In general, the third season after will be soon enough; and if the plantation be from thirty to forty years old, and in a thriving state, it will require to be revised again, in most cases, within seven years.

But one invariable rule ought to prevail in all cases, and in all situations;—to allow no plant to overtop or *whip* another. Respect should be had to *the distance of the tops*, not to the distance of the roots of the trees; for some kinds require much more head-room than others; and all trees do not rise perpendicular to their roots, even on the most level or sheltered ground.

With respect to the *final distance* to which trees, standing in a mixed plantation, should be *thinned*, it is hardly possible to prescribe fixed rules; circumstances of health, vigour, the spreading nature of the tree, and the like, must determine. Whether the trees are to be suffered to stand till *full grown*; which of the kinds the soil seems best fitted for; whether the ground be flat or elevated; and whether the situation be exposed or sheltered, are all circumstances which must influence the determination of the ultimate distance at which the trees are to stand. It may, however, be said in general, that if trees be allowed a distance of from twenty-five to thirty feet, according to their kinds and manner of growth, they will have room enough to become large timber.

OF THINNING GROUPED PLANTATIONS.

Here two things must be considered, namely, whether the plantation be simply grouped; or, whether it have been mixed with nurse plants, with the intention of being afterwards grouped.

In the first case, it should be kept rather thick than otherwise, in its early stage of growth, that the plants may as it were nurse one another. But when the trees have arrived at the height of fifteen or twenty feet, due attention should be paid to *regular thinning*, that the trees may not be ren-

dered unfit for any useful purpose to which they might otherwise be applicable.

In the second case, the treatment is similar to that of mixed plantations until the nurses are removed; with this difference, that the plants which are ultimately to form the group must, from the beginning, be regarded as the prime object; and the nurses, of whatsoever kinds they be, must be viewed merely as the means of bringing forward the principals, and be removed as occasion may require. After the removal of the nurses, grouped plantations of Oak, Elm, Beech, &c. are to be thinned according to the rules already laid down.

OF THINNING FIR PLANTATIONS.

Plantations of Scots Fir, if the plants have been put in at three, or three and a half feet apart, will require little care until the trees be ten or twelve feet high. It is necessary to keep such plantations thick in the early stages of their growth, in order that the trees may tower the faster, and push fewer and weaker side branches. Indeed, a fir or soft-wood plantation should be kept thicker at any period of its growth than any of those consisting of hard wood and nurses already mentioned; and it may sometimes be proper to prune up certain plants as nurses, as hinted at above for nurses in a mixed plantation. Those pruned up

trees are of course to be reckoned temporary plants, and are afterwards to be the first thinned out: next to these, *all* plants which have lost their *leaders* by accident, should be condemned; because such will never regain them so far, as afterwards to become stately timber; provided that the removal of these mutilated trees cause no material blank in the plantation.

Care should be taken to prevent *whipping*; nor should the plantation be thinned *much* at any one time, lest havock be made by prevailing winds; an evil which many, through inadvertency, have thus incurred. This precaution seems the more necessary, inasmuch as Scots Firs, intended for useful large timber, are presumed never to be planted except in exposed situations and thin soils.

At forty years of age, a good medium distance for the trees may be about fifteen feet every way.

It may be worthy of remark, however, that after a certain period, perhaps by the time that the plantation arrives at the age of fifty or sixty years, it will be proper to thin more freely, in order to harden the timber; and that, then, this may be done with less risk of danger, from the strength the trees will have acquired, than at an earlier period; but still it should be done gradually.

Plantations of Spruce and Silver Firs, intended for large useful timber, should be kept much in the manner above stated, both in their infancy

and middle age. As already remarked, planting and keeping them as thick as is consistent with their health, is the best means of producing tall, straight, clean stems, and valuable timber. When planted for screens or for ornament, they require a different treatment; which will be noticed in the proper place.

To Larch plantations, the above observations will also apply; and indeed they are applicable to plantations of all kinds of resinous trees.

It may be proper here to remark, that the *exposed margins* of all young plantations should be kept *thicker* than the interior. The extent to which this rule should be carried, must be regulated according to the degree of exposure of the situation, the age of the plants, the tenderness of the kinds, and other circumstances.

The manner of thinning neglected older plantations will be treated of in *September*; the fall of the leaf being deemed the fittest time at which to judge of the state of health or decay of forest trees.

WOODS AND COPSES.

ON PREPARING THE GROUND FOR AN OAK WOOD.

DIFFERENT methods may be pursued in the establishing of an Oak Wood ; one or other of which may be resorted to, according to circumstances. We shall state them separately.

If the ground be so level, and so free from stones or rocks, as that it can be ploughed, it is the best method to trust the preparation of the land to the plough. In this case, however, we would by no means advise the rearing of an Oak wood on a poor moorish soil. Such land should be reserved to be planted with trees better suited to its nature. The Oak requires, and deserves a good soil ; and if an attempt be made to rear an oak wood in a very bad soil, such an attempt will inevitably fail. The upper soil should be at least six inches in depth, and a tolerably good mould ; such as would, if properly cultivated, produce a fair crop of grain. There can be no objection to a cool, deep sand ; the oak being found to thrive well in such a soil, when once fairly established.

If the ground be in ley, or in coarse-pasturage, and of a quality capable of producing a crop of oats, the field should be prepared by such a crop. After the removal of the oats from the ground, it should be ploughed as deep as the soil will admit, if under nine or ten inches, either by single or double ploughing. It may lie in this furrow till March, and may then be harrowed flat. It must be ploughed again in April, at which time the acorns are to be sown.

In such a case as that under consideration, we would recommend the cropping of the ground among the young oaks for a few years : such cropping will defray the expence both of sowing the oaks, and of keeping the ground clean among them, and will greatly promote their growth, provided the land be not overcropped. The crops introduced must be, not of a scourging nature, but such as lettuces, turnips, potatoes, beans, and the like. Carrots and cabbages are more severe crops, and should, if possible, be avoided. The land should be manured for these crops, as in ordinary gardening. The first crop may be turnip with dung : Beans to follow, without dung : After the beans, a crop of lettuces without dung, which would generally leave the land very fit to be laid down in grass in the following season, without dung. If, however, it were judged necessary, potatoes with a little dung might follow the lettuce, which would put the ground in fine state to receive the grass seeds in the fifth season.

It is certainly the most advisable method to dung the first season ; because the acorns thus receive such powerful encouragement, that the progress of the plants is generally secured. The best manure, is stable dung, well reduced :—it may, however, be of different qualities, according to the nature of the soil.

If the ground has been under a grain crop the preceding season, it will require no other treatment at this time than what is recommended above for land under such circumstances. It is understood that the ground, at the last ploughing which it received, probably in October or November, has been laid up in ridges of such breadth and position as were best calculated to keep the ground dry. There can be no greater error than allowing the land to *sour*, from retaining water on the surface during the winter months. It is therefore a necessary work, to let off all *stagnant* water from intended copse-wood land, and to keep the land during the winter-months as dry as possible.

It is hardly necessary to observe here, after what has been said on the subject, under the head *Ornamental Plantations* for this month, that the ground should, in preparing it for an Oak wood, be as effectually drained, whether in respect to surface water, or that issuing from springs, as if it were intended to be cropped with wheat.

In situations where the plough cannot be introduced, but where it is desirable to rear an Oak wood, and where the soil is fit for the purpose, the following methods may be pursued.

First, if the situation be sheltered, as the banks of a river, or the like, the ground may be pitted, in the same manner as for ordinary planting, (see *Forest Plantations for May*), at the distance of six feet from centre to centre. The pits should be made eight or ten inches deep, if the soil will admit of it, and, at the least, fifteen inches in diameter. They should be filled one out of another; the sward being pared thin off, and laid in the bottom, and chopped in pieces. In the present instance, we recommend this method whatever nature the sward be of; because the pits are intended for acorns. The soil will, by this treatment, be much meliorated by the first of April, the season for sowing the acorns. If the pits, however, had been made in May, or the subsequent months of the preceding year, they would have been still better, by their receiving a longer fallow. If the land be a stiff clay, it is absolutely necessary that the pits be made, if not in May, at least in the autumn months preceding the sowing.

Supposing the pits to be made for the reception of the acorns, let a small patch, exactly in the centre between every four pits, have the turf pared off quite thin, by means of the hand-mat-

tock * ; and then let this patch be stirred up to a good depth by the small end of the mattock :—into the hollow thus made, let a seedling, or rather a one-year-nursed larch be planted. If the ground be not in a proper state to receive the larches, the land so prepared may lie off till it be in a proper condition for receiving the plants. These Larches will have the start of the Oaks to be sown in April ; and will, consequently, both shelter and draw them forward.

Secondly, If the situation be bleak, the ground may be *planted* all over with larches, by the hand-mattock as advised ; above, but at not more than three, or three and a half feet apart. After the larches have stood two or three years, the ground may be pitted for the reception of the acorns. In pitting, in the above case, however, the distances cannot possibly be so regular as if the land had been bare :—the pits may, probably, be from four to seven feet apart, which will answer very well. We have here recommended Larches as nurses, because they are sooner of general use than Scots firs :—the latter, however, are certainly preferable as sheltering nurses for the young oaks : and in places where wood for coal mines, and similar purposes, is required, Scots firs are of nearly equal value with the larch. We have mentioned that two or three years after plant-

* Represented in Plate III. fig. 2.

ing the nurses, is the time for sowing the acorns; but, if the trees have made but small progress, the sowing may be deferred till the fourth, or even to the fifth year after planting the firs or larches.

It will be observed, that we have here advised the sowing of the acorns at much smaller distances from each other, than we have recommended in treating of planting oaks, under [the head *Forest Plantations* for this month. The reason is obvious. Those at present under consideration, are intended for copses, in the first instance, after the removal of the nurses: these copses may, by proper management, be converted into oak woods afterwards, as pleasure or interest may direct.

OF MIXED COPSES.—PRÉPARATION OF THE GROUND.

If it is intended to *plant* the mixed copse, any necessity of enlarging on the preparation of the ground, is in a great measure superseded by what we have said above, respecting the preparing for oak woods and copses. Indeed, the nature of this crop is not so far removed from that of the preceding, as to require any very marked alteration. We have already noticed, that a thorough summer-fallow is the most desirable method of preparation; but that the mode to be followed,

must vary according to the nature of the soil, and other circumstances.

In the view, however, of rearing the mixed copse from seeds, a much more particular attention is requisite; and especially in regard to the raising of those kinds which have very small seeds, as the Birch and the Mountain-Ash. Summer-fallow is certainly very improperly withheld where these, or even the larger seeds, are to be sown. In cases, however, where this is impracticable, the pits should be dug in May, and, after eight months, they may again be stirred; and by the spring months, they may receive a preparative stirring, finally to fit them for the reception of the seeds.

Here, however, we beg leave to notice, that we only admit of *mixed* copses, either sown or planted, as matters of ornament. We have already given our decided preference to the *massing* system, for reasons before assigned. Indeed, we judge it preposterous, to attempt to force any one sort of plant from its own soil, into the soil adapted for another. For example: In many instances where copses are to be raised, there is a great variety in the nature of the soil: Here, perhaps, we have twenty or thirty falls of mossy earth, and withal very damp: Probably, next adjoining is a quarter of an acre of strong clayey soil: On an exposed point, perhaps, a few falls of sandy, worthless soil: and so on. It will readily occur, that the Birch and the Poplar should divide the mossy

part; the Oak and the Spanish Chesnut the clayey soil; and the Mountain Sorb its own exposed situation. The Willow and the Alder might also find a place in the lower and damper part of such a varied surface; and thus may each kind respectively occupy its own native soil in small unequal masses or groups, which would produce a greater variety, and probably yield much more pleasure to a true taste, than any general mixture in the ordinary way. From the various nature of the soil here supposed, the nurses could not, probably, be all larches: Spruce fir would be found to be a better nurse in the low situated places: And if the copse were intended as a cover for game, near a residence, Hazels in abundance should be planted as nurses.

It is, perhaps, hardly necessary to notice, that, in the ground prepared for sowing a mixed copse, the nurses should be introduced, as above recommended for the oak copses. Indeed, land intended for a mixed copse to be raised from seeds, may be treated in all respects, as if intended for an oak wood, as far as regards the sheltering of the young plants.

PLANTING MIXED COPSES.

If the ground under summer-fallow, intended to be planted as a mixed copse, be naturally dry, and if the state of the weather will allow, it may

now receive a finishing furrow to prepare it for immediate planting.

The pits on the other grounds, prepared for the same purpose, should now be examined, to see whether they be in a proper state to receive the plants. Probably such as are situated on elevated places, and sloping dry grounds, or such as are made in light sandy soils, may now be in a fit condition to receive the intended occupiers; and if so, the operations of planting may be forthwith performed in such places. Other portions of the intended copse ground, situated more in hollows and portions perhaps of a clayey or retentive soil, should be left till a more advanced period of the season. Much of the success of the planter depends on his rightly choosing the seasons, for introducing his plants into the various soils. A dry hill may, with the utmost propriety, be planted just now; while a bog, a moist hollow, or retentive clay, ought not to be planted, it may be, for two or three months to come. There is, therefore, very great danger in employing an unskilful operator, and especially in bargaining for the ground being planted at so much per acre, by labouring people, where the sole object of the persons so employed, must evidently be the speedy execution of the work.

It is proper here to observe, that much more is necessary to be attended to, than merely the fitness of the soil, at a given time, to receive the plant. A discrimination of the quality of the soil is re-

quisite ; and it is necessary to be able to determine, whether a Birch or a Spanish Chesnut, an Oak or a Poplar, will thrive best on such and such a spot. Even after having ascertained these points, the nature of the undertaking still requires a little reflection.

One question may be, Does the situation of the intended copse, when the state and kind of the minerals of the surrounding country, and the distance from the sea or a navigable river are considered, indicate the probability of the plantation being used for fuel, or employed in an iron-work ?

If such should become the destination of the copse, it may be cut down, perhaps, once in twenty, or thirty years ; but while the advantages of cutting it down for these purposes are contemplated, the returns to be expected from the bark of the copse wood, are not to be lost sight of. Hence the propriety of introducing chiefly such sorts as are capable of yielding the double advantage of fuel and tan.

We have already glanced at the great utility of adapting the kinds to the particular soils ; yet it is agreeable to remark the beneficence of Nature, in having chosen to vary her productions so much, that we are supplied with several sorts of trees, which will grow luxuriantly in the same kinds of soils, while their qualities are materially different ; and consequently, their value also.

The right assorting of these different kinds of trees to the respective soils, and their proper direction to the proposed end, show true skill in the planter. The person who sets about planting a mixed copse, with an indiscriminate variety of trees, without being acquainted with their different qualities, or their fitness or unfitness for the ultimate purposes intended, labours as much in the dark, as the sportsman who discharges his fowling-piece into a thicket of furze and ferns, expecting to kill the invisible game.

Supposing, then, that a mixed copse be intended for fuel ; and that the soil admits that a considerable variety of trees should be used ; these questions naturally occur, What kinds are likely to make greatest progress in the land proposed to be planted ? Are these well adapted for fuel ? And will their barks, when the trees shall be fit for fuel, contain the tanning principle in a proportion sufficient to render them valuable ?

Although the soil were capable of producing excellent Ash, Sycamore, or Elm, these must necessarily be rejected, because they want at least one of the properties required ; and some of the other kinds, whose barks contain the tanning principle in the greatest quantity, as the Oak, the Spanish Chesnut, the Birch, the Black Poplar, the Mountain-Ash, the Huntingdon and Bedford Willow, and the Alder, must be preferred. Even among the plants just named, it

can hardly happen that there will not be found a sufficient number of kinds to answer even the most various soil and surface which may happen to be contained within the precincts of the proposed copse.

Supposing the copse should consist of the above kinds, the trees should be planted at the distance of six feet apart ; and the interstices should be filled up with a proper number of nurses, best suited to the soil and situation. The greatest part of the nurses should probably be Larches, because they not only rise faster, but they thrive in a greater variety of soils, and their timber is more early of general use, than any other of the nurses generally employed : Besides, the bark of the Larch contains the tanning principle in a very considerable proportion ; and is now generally used in most of the tanworks in the kingdom, which circumstance renders it doubly desirable.

As to the sizes of plants to be used for forming the mixed copse, they should not be more than eighteen inches high, but from twelve to eighteen inches is the best size. The plants should be *stout* ; the more abundant in fibres their roots are, the better will they be found to succeed. The method of planting has already been described in the article *Forest Planting* for this month ; which see.

PRUNING OF COPPICE WOODS.

The observations already made respecting the Pruning of Forest Plantations from infancy onward, will equally apply to that of copse wood. Here, also, every thing must give way to the principal crop. Attention must also be paid to prevent *whipping*, and to preserve a free circulation of air at all times, which can only be accomplished by a timeous pruning and thinning.

THINNING OF COPPICE WOODS.

As advised in the Thinning of Forest Plantations, it is proper here, also, to begin with the removal of the nurses. By the time, indeed, that the nurses are completely removed, or very shortly after, the copse wood itself may probably be in a proper condition for being cut down. It will be understood, that we do not approve of removing the nurses suddenly ; on the contrary, it must be a work of years. They may, however, be all removed by the thirtieth year. If the copse wood, whether mixed, massed, or entirely of one sort, be planted at the distance of six feet between each tree, the principals will not require to be thinned out at all, but will have sufficient room to stand, until they be large enough for the purposes for which they were intended.

The season of felling copse wood must be regulated by the time most proper for taking off the barks ; which will fall to be treated off in the subsequent months.

FENCES.

ON FENCING GROUNDS IN GENERAL.

The utility of fencing grounds is and has been a matter of common consent in almost every civilized and cultivated country. But while its usefulness has been admitted in the most unlimited manner, in too many instances has it been so in theory, without practice. In most parts of the country, we pass but comparatively few fields, and still fewer plantations, without seeing them exposed to the ravages of every browsing animal. A mock ditch, a ragged hedge, or a broken wall, is, in many instances, the doughty barrier to defend a valuable property from the inroads of cattle. Yet, with comparatively a small sum, fences both of durability and elegance, could be constructed and preserved. Indeed, nature has so abundantly provided the means of protecting the labours of the field, that, where living fences are

difficult to be raised, stones are generally very abundant ; so that proprietors are literally “ without excuse,” in having their arable fields and plantations exposed to the depredations of cattle.

The superiority of living fences over dead ones seems to be established by common consent.

Many varieties of *deciduous* plants have been recommended ; but none of them have been so generally adopted as the common Hawthorn. Indeed none answers the purpose nearly so well. It not only makes the closest and most perfect fence, but it readily takes with almost any soil, and grows vigorously in almost every situation ; while most other hedge-plants affect their own particular soils, and show impatience when placed in others.

Evergreen fences, of great beauty, value, and durability, may be formed of the Holly ; and there are few soils in which it will not grow well.

DITCHING.

The lines and boundaries to be converted into fences by ditch and hedge, must depend upon circumstances, the consideration of which does not at present fall in our way. Yet, in general, it may be observed, that the line of the ditch to be made, ought to be adapted as much as possible to carry off, both the surface water, and any spring water

contained in the subsoil. Moving the line a few yards either to the right or to the left, will surely appear a trifling matter, in comparison with laying a field dry, or even maintaining the line of beauty with the boundary of some adjoining plantation. It need hardly be here observed, that the ditch should be so constructed, as that no part of it will retain standing water. A declivity should be secured in every part of the bottom of the ditch.

THORN PLANTS.

The rapid progress of the hedge depends in a great measure on the goodness of the plants employed. The goodness of these, however, does not so much consist in the thickness of their stems, as in the numerous fibres of their roots. A very thick stemmed plant may have hardly a fibre at the root to support it when planted. The most desirable plants are therefore such as have the greatest number of fibres at their roots, with a clean and vigorous stem. It must be observed, that if thorns stand in the nursery line more than one, or at the most two years, unmoved, their roots become thinner of fibres, which consequently renders them less fit for the purpose of planting for hedges, than if they had been removed at an earlier period of their growth.

One-year seedlings of good growth, nursed for one year in rich earth, will generally make fitter

plants for planting out, than when they are allowed to stand for two or three years in the nursery lines. Two-year seedlings, carefully lifted from the seed-bed, so as to preserve their roots entire, and then one year nursed in rich mellow earth, will also make excellent plants for hedges. Indeed, plants of these ages, so treated, will outgrow those of greater size in any soil or situation whatever. The cause obviously is, that small plants, even by the same treatment, are raised with better roots, in proportion to their stems, than larger plants. In the choosing of quicksets, respect should therefore be had to the *roots*, more than to the tops of the plants.

But there is a double advantage in using young plants as above recommended. If they are to be bought they will cost less money than older ones. If they are raised in a private nursery, less time is required, as well as less labour, to produce them. Further, they are better fitted for very exposed situations, than such as are older; not because their tops are less bushy, which, since these are to be cut off, is immaterial, but because they have better roots, and more fibres in proportion to their stems, and, of course, are better fitted to seek pasturage for their sustenance, and to take a firm hold of the soil.

As above hinted, the stems of the plants should be cut over about half their length, or generally about six inches above the *ground mark*. This

may be performed by the hedge-shears ; but a better method is, to gather a handful *evenly*, lay them on a block, and chop them through with a sharp hatchet, which makes a cleaner cut than the shears. It is of importance to make the wounds, on the young thorn plants, as clean as possible. For this reason, some are at the trouble of cutting the young plants individually with a sharp knife ; and it must be allowed, that this, although the most tedious, is certainly the best method of cutting over thorn plants, to prepare them for being laid in the ditches.

After the observations already made under the head *Nursery*, and considering those to be made, respecting lifting plants from the nursery ; we need hardly here direct, that every the smallest fibre of the roots should be preserved in the lifting of the thorn sets ; and that the roots should be as little exposed to the air as possible.

METHOD OF DITCHING.

Having fixed upon the direction of the ditch, the side next to the plantation, or field to be fenced, is to be *rutted* off by the hand-line. The operator must stand with his face outwards, and hold the spade in such a direction as to form the slope of the ditch to the depth of the *rut* as he proceeds. If the sward be in ley, it should be pared off as thin as possible, to the extent of one foot in

breadth, along the side of the rut where the bank is to lie. This is cleaning the *scarsement* beforehand, and is done to prevent a rank growth of herbage the following season. If the land in question has been in tillage the preceding season, the operation of paring will be unnecessary.

Having now finished the above, run another rut along by the line, on the surface of what is afterwards to become the ditch, a foot from the former rut. Go along, and *notch* the inner space crosswise, keeping the spade in one position, so as to form turfs of about a foot square. Begin at one end, and turn these sods at one cast of the spade, so as they may be inverted with their edges at the distance of about nine inches from the first rut, which is now the face of the ditch, keeping them exactly in line, and joined close to each other: thus a *scarsement* of about nine inches broad will be formed. In light, sandy, or gravelly lands, however, the *scarsement* should not be less than a foot broad; as, otherwise, the brink might crumble down, and leave the roots of the plants too much exposed. Another row of sods is now to be lifted from the surface of the ditch, and thrown at random beyond, but not away from the former. This is done to increase the surface mould whereon the plants are to lie; and, where there is no turf, the operation is unnecessary. The operator must now go along the first row of sods; smoothing all inequalities, and laying the surface in a

gently sloping position, so as that the roots of the plants may *dip* a little, and the tops may incline upwards. Having the bed finished as above, if necessary, procure some well-rotted dung, and lay on a thin *sprinkling*. A very small portion of earth may be applied above the dung; being careful, however, to cover it, so as that the fibres of the plants, when laid on the bed so prepared, may not immediately come in contact with the dung. The thorns are now to be so placed, as that the point where they were cut over may be about an inch beyond the margin of the sod towards the ditch, and from six to nine inches apart, according to the quality of the soil, and the purpose for which they are planted. They are to be covered, as speedily as possible, with a portion of the best mould from the ditch. But on the opposite side, to the width intended, the richer parts of the remaining earth are to be thrown up, and laid immediately beyond the roots of the plants. In the event of protecting the hedge with a railing, the remaining earth is to be laid in a neat ridge, sloping backwards from the thorns. The ditch must be equally sloped on both sides to the proposed depth, keeping it one foot wide at bottom, whatever be the size of the ditch. The general rule for making ditches for hedges is, that whatever be the breadth at top, the perpendicular depth should be half as much. For instance, a six feet ditch must be three feet deep; a five feet ditch, two and a half deep; and a four

feet ditch, two feet deep; and so forth. Six feet ditches made in the above form, without thorn plants, may be rendered tolerable fences, by sowing *whin-hedges* along the ridges of earth laid up in *March*; which see.

TOP DIKES, DEAD HEDGES, AND RAILS.

If, in the view of protecting the hedge, or more completely fencing the inclosure, it is intended to build a dike or wall on the top of the ditch, in Sir George Suttie's style, it is necessary to flatten the earth thrown from the ditch, so that it may stand about a foot above the thorn bed, with the side thereto neatly sloped back. The height of the wall may be thirty inches; the foundation twenty inches broad, and the top fifteen. The height of the dike must be regulated by existing circumstances. The outer face of the dike, next to the ditch, may stand ten or twelve inches back from the face of the thorn-bed, according to the loose or retentive nature of the mould. The building of the top dike should be deferred for six or eight months after the casting of the ditch, to allow the earth to consolidate, that the stones may lie more secure. Even the placing of the dike is a particular matter. If it stand too far forward or outward, it is in danger of slipping down, and the hedge cannot be cleaned and dres-

sed without difficulty ; and, if it stand too far back, the space may afford the cattle an opportunity of scrambling up and treading down the hedge, and defacing the ditch.

The materials of which the *dike* is to be constructed, may be a matter of choice or of necessity. Flat square *stones* are the best, because they lie more securely, especially if they are of some considerable size. The top should be finished with stones the breadth of the wall.

Bricks may be used with propriety ; but the great expence is almost a prohibition.

Some improvers have built their *top dikes* throughout with lime ; but where stones of a good size can be had, they will stand very well without any sort of mortar for four or five years, by which time the hedge may be a tolerable fence, and the services of the dike may be dispensed with.

In districts where stones are not to be got, recourse may be had to *turf*, or well dried *peat*, for constructing the walls ; or even *unburnt bricks* will do : for any of these may be made sufficiently substantial to stand, with occasional helping, till the hedge becomes a complete fence. Such walls, however, require to be built in the spring months ; which see.

In situations where none of the above materials can be got, recourse may be had to *pales* or *rails*, or to *dead hedges*, formed of brushwood. The

method of making brushwood-hedges, is as follows: Having flattened the earth thrown from the ditch, as directed for the foundation of the *top dike*, cut a trench a foot square, turning the earth inwards. Set in the brushwood, so as to stand three feet above the surface, taking care to intermix the great and small together, and ram it firmly in, returning the earth, and firming the ends in the trench as well as possible. When the placing of the hedge is finished, clip the sides, so as that the side next to the quick hedge do not interfere with its growth, or hinder the operation of cleaning, or the like; the other side may be dressed in till the dead hedge be about eighteen inches thick, and the height three feet.

The position of the rail is in a great measure a matter of indifference, provided it be so placed as to protect the young hedge, and the plantation or field. Perhaps the most terrific manner of railing, is by using rails with a great many *knaggy** stumps about a foot long. The posts are to be driven into the face of the bank, a few inches above the plants, and in an inclining position, so as to form an angle of about 60° with the horizon. Two rails of the above description are to be nailed on; one a foot above the plants, and the other eighteen inches or two feet above that. A barrier will thus be formed, that few pasturing animals will attempt to pass.

* Sharp and rugged.

PLASHING AND CUTTING OLD HEDGES.

Hedges which have been long neglected, shoot up to a great height like trees, become naked at bottom, and occupy too much ground, at least for lands in a state of high cultivation. The best method of reducing such to a proper size, and of forming them into an immediate fence, is by *Plashing*. This consists in selecting the strongest and straightest shoots. These are to be dressed up and headed down to four feet, and in such a way that the tops of the whole may range in a neat line. These are called the *stakes*; and, when they are deficient, either in strength or number, recourse must be had to artificial stakes, which must be driven in to stand firm, and supply the deficiency of natural ones. Having proceeded thus far in preparing the hedge for plashing, the hedger is to begin at one end, and bend down as close as possible the remaining pliable branches, crossing them in the manner of basket work. Such as are too strong to be bent, may be cut half through with the bill, which will render them pliable enough to be used; and such as are not required for any of the above-mentioned purposes, must be cut off close to the ground. After the plashing is finished, the hedge should be dressed smooth on both sides by the switching-bill or shears.

A Hawthorn, either in flower or in fruit, is a beautiful object. The time of plashing hedges is a proper period for selecting such as promise to make handsome trees, which should be left for that purpose. Surely the most parsimonious will grant this indulgence to his neighbours, who may happen to have a taste for such objects. They will repay him with many thanks ; and the feathered tenants of the grove will sing his praise for the haws, in their ' wild warbling notes.'

There is another method of plashing, which has been suggested as an improvement upon the foregoing ; and that is, by not cutting any of the stems over as stakes, but weaving in the tops along with the other branches. This method will not have so immediate a tendency to bare the lower parts of the hedge by the growth of the top, as when many of the plants are cut over for stakes ; but still, at the bendings, the growth will rush out with vigour : besides, this plan is attended with more labour. Indeed, the best security against baring the bottom of a plashed hedge, is by cutting over by the surface as many of the plants as can be at all spared ; and the shoots arising from these will soon thicken the hedge at bottom.

Plashing, however, can only be effectually and handsomely performed, when there is a good portion of long, pliable, and well feathered branch-

es, and where the hedge has, if not youth, at least vigour, on its side.

After the plashing is completed, the ditch is to be scoured out, and the bottom of the hedge cleaned and dressed up, in the same neat manner as if all were new work.

Cutting over old hedges, is a much less expensive method of reclaiming or renewing, than any of the above ; and, perhaps, in most cases, may be a more eligible one ; saving when an immediate fence is the object. In cutting down an old hedge, there is certainly a very fit opportunity of laying the foundation of a complete and durable fence.

The nature of the cutting must be regulated by circumstances, according to the age, the strength, or the closeness of the hedge, and whether it have been planted in single or double rows. If the hedge in question be pretty vigorous and branching towards the bottom, and if the stems stand regularly and closely together, it may be brought into due subjection, without being cut down to the ground. In this case, the sides are first to be switched up with the hook, not altogether close to the stems, but within about a foot of them on each side at bottom, tapering up close at top, which should be four or five feet high, according to the general height of the hedge : But if the hedge be thin at bottom, it will be advisable to

cut more in, in order to make it bushy from the ground upwards.

If the hedge is not regularly close from end to end, but ragged, and full of gaps, the best method is to cut it over, within eight or ten inches of the ground, and to fill up the gaps with stout, well-rooted plants of the *same kind*; or the gaps may be mended by the following method: Let one of the stoutest thorn plants next to the gap be reserved uncut, and the space be dugged over, or it may require to be filled up with rich earth to within three inches of the height of the top of the ditch. Then having cleaned the thorn plant of all side branches or twigs, cut it half through at the height of the earth in the gap, on the side farthest from it, and lay it down upon the earth, securing the most distant end from rising up by a hooked pin; then cover it all over with rich earth, so as to make it the general height of the top of the ditch; and the thorn plant so laid down and covered, will take root, and send up a profusion of shoots over its whole length. If one plant will not reach the whole extent of the gap, one at each side probably will *. The

* The practice of filling up gaps in *thorn* hedges with sweet-brier or barberry, or indeed any other sort of plant than its own kind, is one which has never recompensed those who have done it, for their trouble, and which generally increases the evil it was intended to diminish. Every hedge should be

surface of the bank should be pointed up, and the ditch scoured as above directed in plashing.

In other cases, when the hedge is getting thin below, or too tall,—and where the stems are placed regularly within eight or ten inches of one another,—and where it is necessary to retain a fence and at the same time to cut, so as to have a supply of young shoots from the bottom,—the plan to be followed, is to cut alternately the one part to within eight or ten inches of the bottom, and the other at four feet high;—dressing the bank, and scouring the ditch, as directed above.

In cases where two rows of quicks have been planted, the front one is to be cut by the surface, and the other at four or five feet high, as circumstances may require.

In closing this article upon cutting fences, we would entreat proprietors and others to guard, with great caution and care, against the ordinary method of hashing them downwards with the bill, so as to split the stock: the cut ought always to be made upwards in a slanting direction, and so as to leave the stock quite whole and smooth at the place where the wound is made. Indeed, in every

*beetled up** with plants of its own kind; because the habit of growth, and sameness of nature, fit them more perfectly for associating with their kindred, than any accidental circumstances can fit a stranger for being introduced.

* i. e. Mended with living plants.

case where a wound is to be inflicted on a living tree, it ought to be made as smooth and clean as possible, that the effort of the plant to restore the wounded part to a sound state be not counteracted.

ON SUNK FENCES.

A Sunk Fence is formed by an excavation of the earth, in a triangular form, to such a depth as existing circumstances may require, and facing up the perpendicular side with a stone wall.

The most common rule for the proportions of the Sunk Fence, on level ground, is, that whatever be the depth of the facing wall, the length of the slope, from the general surface of the field, to the bottom of the facing wall, shall be twice its height. It would, however, be impossible to apply this rule in many cases ;—indeed, almost every separate field, intended to be fenced in this manner, requires some deviation from the above rule.

In cases where the Sunk Fence is intended to defend a plantation from the depredations of pasturing animals, a five feet wall will be found generally sufficient ; but in cases where the surface is unequal, and where it is necessary that it should operate in the double capacity of a fence and a drain, these circumstances must regulate the height of the wall, as well as the degree of slope.

One general rule in subdividing fields by the Sunk Fence, is to place the perpendicular wall next to the place from which the principal view or prospect is likely to be taken ;—as, for instance, if a mansion-house be so situated, that the surrounding lawn must be divided into separate enclosures, while it is desirable that this be done in such a manner that the dividing fences be not seen, a sunk fence is suitable ; but the wall of the sunk fence must be placed next to the house ; because, were the slope to be so placed, part of the wall would inevitably appear from the windows of the second or third floor, or from any corresponding eminence, and destroy the effect which it was wished to secure.

In no case, perhaps, ought the wall of the sunk fence to be built without mortar ; being intended for a permanent fence, it ought to be substantially made ; a five feet wall ought to be eighteen inches thick at bottom, and twelve at top. Walls of greater or less height should be of strength in proportion to the resistance they have to make ; but, especially where the cut is very deep, stones of great weight are required to be used ; and, in general, sunk fence walls should be built with stones as large as the size of the wall will admit of.

GALLOWAY DIKES.

Galloway Dikes form the cheapest and easiest method of fencing, where stones abound.

As implied in the name, they are very common in the south-west district of Scotland. Now, indeed they are to be seen everywhere. What are called *land-stones* answer for their construction; and many districts of country abound so much in these, that removing them is an essential part of improving the soil. In such cases, the rearing of Galloway dikes is comparatively an easy task.

The chief art in building them consists in assorting the stones at sight, so as that they may bed well, and hold together firmly. The low price generally allowed for this kind of building will hardly admit of the use of the dressing tool. The flattest and squarest of the stones which are of a considerable size, should be used in building about two feet of the lower part of the wall, while the more irregular pieces of the largest size should be reserved for the under part of the coping, which is to be terminated of a wedge-shape upwards, with the smaller stones. The quality of the materials must generally determine the height of such walls. The best stones will not admit of being built more than five feet high in this way; but from four to five feet may be the medium height of the Galloway dike.

DRY-STONE DIKES.

Fencing with common stone dikes may now be carried on with propriety. The stones most

proper for building dry-stone dikes are such as naturally have a flat or square form from the quarry. Walls built with such materials, and afterwards, at the proper season, pointed with good mortar, and coped with *danders**, as advised for stone and lime walls in *March*, will stand a very long time. If, however, the stones are round, or awkwardly angular in their form, it would be better to build them into Galloway dikes, or with mortar at the proper season.

There is another method of subdividing large grass inclosures, used in many domains with great advantage; and that is hurdles or palings. They are but of short duration, but when there is much young wood about the place, they can be easily replaced or repaired. They are more acceptable to the eye than stone fences or hedges, and do not give a notion like these of diminished extent.

* Slags from glass-houses, salt-works, or iron-founderies

FEBRUARY.

February.

THE NURSERY.

THE season is now arrived which calls for all the vigilance of the nurseryman ; a variety of articles will be pressingly demanding his attention ; among the foremost of which will be the lifting of seedling Thorns, Larch, Elms and Birch. Indeed, the lifting of all deciduous seedlings from the seed-bed should be performed in the course of this month, if not previously done ; and, in the performance of this labour, much attention is necessary.

ON LIFTING SEEDLINGS FROM THE SEED-BED.

Thorns or Quicks.

If only one year has elapsed since the sowing of the haws, many more plants may be expected to

rise this spring ; therefore, the greatest care must be taken not to deface the beds or drills in which they stand. If the earth be turned upside down, the seeds which would otherwise have risen will probably be too deep buried, or, it may be, laid upon the surface quite bare of covering. The utmost attention to avoid such evils is requisite.

The best method is to ease the plants gently with a fork, but so as not to turn over the earth : by so doing the plants will come up readily by a gentle pull. In the operation of easing the seedlings, the fork is to be put straight down to the depth of the roots :—one side of the bed is as far as a person easing seedlings can reach to at once ; therefore the *easer* must go round the bed, in order to perform his work completely.

After the easing of the seedling thorns is performed, the plants are to be pulled up, and, as they are pulled, laid evenly in the hand ;—an hundred is as many as can be conveniently held at a time. In the operation of pulling, care must be had not to draw the plants to one side, but perpendicularly ; so as to keep the surface of the bed quite straight. If the weather be dry, they must be instantly *shoughed*, in such a way as that a thousand may occupy about two yards in length ; in which state they may lie till they be finally planted out.

After the pulling of the seedlings is over, the beds should be carefully weeded, and a small por-

tion of earth from the alleys thrown evenly over their surface : Afterwards they may receive a very gentle dressing with a short-toothed rake ; in which state they are to remain to produce the expected second year's crop.

LIFTING ELMS FROM THE SEED-BED.

The beds of elms which were produced from seeds gathered and sown last June, may, like the beds of thorn above noticed, be expected to produce, this spring, many more plants, from the seeds which did not then vegetate ; they must therefore be treated in all respects as directed above for the thorns.

The one-year seedling elms, produced from the seeds that were kept over winter, and sown last March or April, require a very different treatment from the above. The whole of the seeds then sown, which were capable of growing, have produced plants ; therefore, there are no more to be expected from such sowing. In case two-year seedlings be required, such should be thinned out to a proper distance, if they need it, and left for another year ; by which time they will be fine stout plants. In thinning out for two-year seedlings, the bed must not be eased, as above directed for the quicks, and last June sown elms ; but they must be pulled up by main force. Were

they eased by the fork, the vigour of the remaining plants would be greatly lessened. The roots of the plants so pulled up, are no doubt very much hurt :—hence the great propriety of sowing such as are intended for two-year old seedlings *quite thin*, so as not to require thinning out by the hand.

LIFTING LARCHES FROM THE SEED-BED.

If the one-year seedling Larches have made growths of from four to six inches in length, they should be all taken up and *shoughed* for planting. In this case, they should be eased with the spade in such a manner, as that all their roots may be kept entire in the pulling ; and this can be done the better, since the turning over the ground is a matter of indifference.

If, however, there be a great many among them too small for lifting ; or, if two-year seedlings be required, they are to be thinned out to two or three inches distance, which will allow room for fine growths to rise in the following season. The operation of thinning must be performed without the trees being eased by the fork. Indeed, no beds of any kind of trees, part of which are to be left for two-year seedlings, ought to be eased ; otherwise, those left will make far worse growth than might be expected. So soon as the one-year larches are lifted from the seed-bed, they are care-

fully to be shoughed thin in the rows as above directed for the young thorns; only, a thousand larches should occupy fully five yards in length. In no case can this precaution be dispensed with: We have known larches lifted, and tied up in bundles, and kept in the house for a month, or perhaps for two months, before planting, in order to save labour; but it never fails to ruin many thousands of the plants. Indeed, seedlings so treated, never make so vigorous growths the first season after planting, as those that are shoughed as above directed. The keeping of the seedling trees of any kind, in bundles in the house, to wait the time of planting, or even the shoughing of them in bundles, or too thick, cannot be too earnestly guarded against. We are persuaded, that more plants are ruined for want of attention in the above respects, than die by adverse seasons after planting in the nursery.

THINNING OUT BIRCHES AND ALDERS.

The Birch and the Alder generally rise very thick in the first year after sowing. The best and stoutest plants should be pulled out till the remainder stand an inch or two apart, which will allow good plants to rise. We have already observed, that the ground must not be eased when two-year seedlings are intended. In pulling out the birches and alders, care must be had to pull them straight up, and not to one side.

LIFTING ONE-YEAR MOUNTAIN-ASHES.

The beds in which the one-year Mountain-Ashes are grown, often contain many seeds which will vegetate next spring. Care must therefore be had, not to deface the beds. The same mode of treatment will answer for them, as is above recommended for the one-year thorn beds.

LIFTING AND THINNING OUT ONE-YEAR SEEDLING BEECHES.

If the Beeches are intended for being transplanted at one year old, they should be eased by the spade, as above advised for the one-year larches; but if they are intended for two-year seedlings, the land must not be disturbed by any means.

What is here said, in respect to the Beeches, will equally apply to Sycamore, Ash, Oak, and Laburnum. Such, however, of these as are intended for two-year seedlings, ought rather to be sown thin; which will save much trouble, and produce fully better plants.

The Walnut, the Spanish Chesnut, and the Horse Chesnut, ought all to be lifted at one-year seedlings, and transplanted.

Filberts and Hazels, however, may be treated as above advised for the beech.

LIFTING TWO-YEAR SEEDLINGS.

No sort of Seedlings should remain longer in the seed-bed than two years ; otherwise, their roots become too naked, and the fibres too few in number. The whole of the deciduous kinds should be lifted in the course of this month. There are no more plants to be expected of any of the sorts ; nor is any care necessary to preserve the beds from being defaced :—the only object now to be attended to, is, to lift them with as many fibres at the roots as possible. This is best done by easing them with a spade, putting it straight down to the depth of the roots, and turning them up, so as the plants may come away by an easy pull.

The *shoughing* of the two-year seedlings is also immediately to follow, upon their being lifted ; only, they must occupy a larger space, according to their size. Nothing, we repeat, is more destructive to young seedling trees, than allowing them to lie too thick together in the *shough*.

LIFTING TREES FOR FOREST PLANTING.

As above observed, in regard to seedling deciduous trees, such as are transplanted, and intended to be lifted for forest planting this season, should be removed in the course of this month. It is much better for them to be lifted and laid in the

shough, than to remain in the established state in which they have stood during the summer, because they begin to push much earlier in the latter than in the former state; and any check of the flow of the juices by improper lifting, is highly prejudicial to the plants. The same care not to shough them too thick, as was advised in respect to the seedlings, is necessary; neither should they lie long exposed before being shoughed.

OF PLANTING.

We have already hinted, that quicks are the most forward in growing in the spring; therefore they should be first laid, or planted out. We have several times mentioned the necessity of preserving all the roots possible on the young plants. It has already been shown, that this is essential to their future welfare. We therefore decidedly prefer *laying* the young plants in the nursery lines; because thereby the whole roots can be preserved unimpaired; and they can be better disposed than when they are dibbled. We readily acknowledge, that laying is a less speedy method of planting; but the advantage which the tree receives by this method over the other, especially in the case of very fibrous plants, much more than counterbalances the excess of labour.

Such seedling plants as are robbed of the most of their fibrous roots, by being pulled out from

among those that are intended for two-year seedlings, may, and ought to be dibbled in, together with any sort, the roots of which are similar: but it never can, in any case, be proper to huddle together the fine fibrous roots of a plant into a hole, probably not more than an inch and a half in diameter.

LAYING OF QUICKS OR THORNS.

It is necessary to notice here, that the land fit for receiving the young plants, is such as is friable, well parted, and rich. If they are planted in hungry, hard land, they will neither make roots nor tops any way desirable. Even although the land be pretty rich, it would be proper to add a light dressing of small dung, in order the more perfectly to enable it to produce strong, vigorous plants.

Having provided all things to begin the operation of laying, look for the open furrow left at the side of the quarter from the last digging; and, if there is none, begin at the most convenient side of the plot of ground: Open up a furrow, and lay the earth from it down where it is intended to terminate the work of laying. Dig a spade-breadth, keeping as straight as possible, and smooth the surface a little with the spade. Then stretch the garden-line where it is intended the first row of quicks should stand. Beat the earth

very gently along the line with the back of the spade. Then begin at one end, and cut the earth perpendicularly along the side of the line, drawing the earth into the furrow in the progress of cutting.

Having thus made a cut for the plants, lay them in, so as to have them covered fully as deep as they were in the seed-bed, and at four inches apart in the row. Having now completed the disposing of the plants, lay a portion of the earth with the spade gently upon their roots, so as not to displace any of them. After this is done, tread all in the furrow gently with one foot. Lay another spadeful of earth towards them, and so on till the space be made as broad as is wished, taking care not to raise it above the general surface. Proceed as directed for the first line, and so forth till the whole be completed.

The distance between the drills or lines of thorns must be regulated by the size of the plants, and the time they are intended to stand. If they be one-year seedlings, and such as are to be nursed only one year, nine or ten inches between the lines is quite sufficient. If they are to stand for two years, twelve or fourteen is little enough; but in no case should the plants stand too near to one another in the lines. It is better to make the spaces small between them, than to have the plants crowded in the lines.

LAYING LARCHES.

The soil most suitable to receive seedling Larches, is such as is tender, and which has been under green crops, with dung, the preceding season. It is wrong to plant larches into land newly manured with fresh dung. Though larches will thrive well in rich land, they are quite impatient of that which is recently manured with fresh dung. They often die in great numbers from this cause. The distance at which larches must be laid, will depend on circumstances, as in the case of the thorns. If they are one-year seedlings to be nursed one year, four inches apart in the lines, and twelve between the lines, will answer well. If the same are intended to stand for two years, they should be five inches apart in the lines, and fifteen inches between the lines. The larger sized of the two-years seedlings, should, however, stand six inches apart in the lines, and only twelve or fourteen between the lines, because they are intended only for being nursed one year. Indeed, they never should, if possible, be allowed to remain longer in the nursery than one year.

It may be proper here to observe, that all the two-year seedlings of every kind should be *sized*, that is sorted according to their respective sizes, previous to planting. When in the seed-bed, they never all rise to an equal height; and if they are

planted without being sized, this imperfection is prolonged and increased : By sizing the plants at first, we not only procure equal sized trees ultimately, but also prevent any of the smaller ones being too much overtopped in the progress of their growth, as they certainly must be, if a degree of equality is not originally attended to. The expence of sizing two-year seedling plants, will be more than repaid by the difference of ease in planting them, to say nothing of the other advantages above mentioned. Boys or girls, or aged women, who at this season are of little value in the nursery, can perform this labour very well in an out-house.

The observations above made respecting the planting of Larches, will equally apply to the Sycamore, Beech, Ash, Mountain-ash, Birch, Alder, and others ; only whenever it is at all in the power of the nurseryman, he should adapt his plants to his soils. We by no means propose that there ought to be in a nursery a particular soil for every particular kind of plant ; but if, for instance, there be a dry sandy spot pretty rich, there should the Sycamore be placed. The Mountain-ash, the Beech, and the Ash, may occupy such as are a degree less sandy ; the Oak any spot consisting of a strong clayey loam : while the Birch and the Alder should be placed in any mossy damp quarter ; and the Willows and Poplars in such as are damp and loamy.

DIBBLING OUT PLANTS.

We have above noticed, that many plants ought to be planted in the nursery by the dibble. The thinnings of such as are intended for two-year seedlings, are most proper to be planted by the dibble. In order to plant in this manner, the land should be recently dug, so as not to be dry on the top before being planted. It should be well broken in the digging; and if the plants are very small, it may be advisable to give it a dressing with the rake. Having prepared the ground according to circumstances, stretch the line where it is intended the first row of trees should stand; and, with an iron-shod dibble, make a perpendicular hole close by the side of the line; put in the plant as deep as necessary, and so as not to double up the roots; then put in the dibble so as the point of it may, in an angular direction, touch the under part of the root of the plant; give it a smart press upwards, keeping the point of the dibble in the same place as before: so will the plant be firmed, by the compressing of the portion of earth betwixt the first made hole and the dibble in the last angular position. Proceed in the same manner to the end, keeping a foot on each side close to the line; by which the plants will be properly firmed. We have known many thousands of plants die in the nursery lines

the first season after planting, owing to their not having been well firmed in the ground in the operation of planting.

It may be almost unnecessary to mention, that the distance at which planted trees should stand, must also be regulated by the circumstance of the length of time they are intended to be nursed, and the like ; as above noticed in treating of laying plants.

OF PREPARING TREES FOR PLANTING IN HEDGE-
ROWS, AND DETACHED TREES IN THE PARK, &c.

Under the article *Ornamental Plantations* for last month, we hinted at the necessity of having such plants as are to be planted as hedge-row or detached trees, of a greater size than we have all along recommended for ordinary plantation. We have also hinted at the impropriety of allowing any tree which may be intended for transplanting, to remain unmoved in the nursery for a longer period than two years. In the first year after any plant is removed in the nursery, it generally forms a multiplicity of very fine fibres. These, in the second year, shoot abroad in all directions ; yet not so far, but that the plant may be lifted, and the greater part of them be preserved. But if the plant be allowed to remain for a season longer unremoved, the principal roots stretch themselves far abroad, and carry with them to

their extremities, the fine fibres or feeders of the plant ; which, in its subsequent removal, never can be preserved for its benefit, but must be severed from it, and left in the ground, to the great detriment of the removed tree. Hence, in preparing plants of considerable size for hedge-rows, or such purposes, appears the necessity of removing them in the nursery at the end of every two years at farthest. It is by this management only, that a sufficiency of fine roots can be procured, to secure the growth and vigour of the plant at its final removal. It will readily occur to the experienced nurseryman, that this object cannot, be obtained, otherwise than by placing the plants in fine, friable rich soil, somewhat sheltered.

The replanting of deciduous hedge-row trees in the nursery, must not be left undone beyond this month ; because, in such situations as are fit for them, the growth begins more early than in the more exposed quarters of the nursery.

The distances at which they should stand at their removals, must be regulated by their respective ages and growth. But in no case should they be crowded. A properly raised young tree should resemble in its trunk, as well as in its branches, a slender cone, gradually diminishing in diameter from the root upwards, till it terminate in a point : and this object can never be gained, if the plants be placed in a crowded manner in the nursery.

If the plants to be removed be three feet high, they should occupy squares of eighteen inches at least; if four feet high, squares of twenty inches; if five feet, squares of two feet; and so forth, according to their heights.

If plants intended for hedge-row and detached ornamental trees are raised with attention to the above hints, they will richly recompence the labour, by their increased advancement in growth and handsomeness of appearance.

SOWING SEEDS.

This is now a proper season for sowing several sorts of tree seeds, especially such as have been left in the rot heap since the preceding autumn. If they be allowed to lie beyond this month, they chip, and seldom after make so fine plants the first year after sowing. A better season, however, for sowing from the rot heap is in *September*; which see.

Sowing Haws.

Choose a piece of the lightest and richest land whereon to sow them: If it be not very rich, a supply of fresh dung should be added. Let it be well dug, and broke in the digging, and raked fine, to the depth of the proposed *cuffing*, at least.

If it be proposed to sow in beds, they should be three feet four, or three feet six inches broad ; and *cuffed*, so as to allow a covering of one inch deep. The operation of *cuffing* is performed as follows. After the ground is dug, and raked fine as above, measure the purposed width ; stretch the garden line, and run it off along the side by the tread of your feet ; return with one foot in the tread of the other, and so as to form an alley of three times the breadth of your foot. Having shaped the bed by these means, and being provided with a wooden-headed or cuffing rake, stand on the alley of the opposite side of the bed ; turn the rake on its back, and push off the earth from the one half of the bed to the purposed depth, as far as the side of the alley marked by your feet, being careful to keep the earth so pushed off quite straight. When one side is finished, turn round and do the other in the same manner. Having completed the cuffing of the bed, carry the rotted haws, in a close-wrought basket, in one hand, and with the other lift them out ; and, with a sudden dash, cast them along the half of the bed next to you ; turn round and do the other side in the same manner. If your seeds are good, they should lie within one fourth of an inch of each other. Having completed the operation of sowing, if the state of the seeds will allow, draw a roller of about sixty pounds weight,

and exactly the breadth of the bed, along it, which will press in the seeds, so as they will maintain their place during the operation of drawing on the earth again, which is presently to be done. If, however, the seeds are too moist to allow the roller to pass over them without sticking to it, beat them in with the back of the spade. The operation of fixing them in the soil being performed by one or other of these means, take the rake, stand on the alley on the opposite side of the bed; put in the teeth of the rake immediately beyond the cuffing or ridge of earth pressed off, and, by a sudden pull, draw it on the bed so as to cover its own half equally: And having finished this half, turn round, and finish the other in the same manner; and the operation is completed. If the work is performed in a proper manner, nothing more is required. Indeed, the teeth of the rake ought never to be used upon the surface of the bed after sowing by cuffing: There must have been some imperfection in the work wherever it is required; save, perhaps, after sowing Birch or Alder; and, even there, it were better spared.

Supposing that circumstances forbid cuffing, or that it is required to sow the haws in the form of drills, the following plan is to be followed. Having the land under the same circumstances, in respect to richness and quality, as previously directed, let it be well dug and raked, *i. e.* as

much of it as is judged sufficient for immediate sowing. Stretch the line immediately beyond the place where it is wished the first drill should stand; take the spade, and, stooping down, lift the earth along the side of the line next you to an inch in depth, and the breadth of the spade, taking care to leave the bottom flat. Having by these means finished the drill or bed, take the basket with the seeds; stand upon the unsown ground; go along, and sow a proper quantity of seed in the bed. Stretch the line again, leaving a free space ten inches broad between it and the new-sown drill; proceed to lift up the earth in the same manner as before, carefully covering therewith, in as equal a manner as possible, the new sown drill; and so forth, till the intended sowing be completed.

Sowing Ash.

If there are any Ash keys in the rot heap to sow, the same treatment will answer completely; only they must be sown thinner than the haws. Half an inch between every two good seeds will be enough. There is no need of being so particular in respect to the richness or quality of the soil for them; only, it ought to be well broken with the rake. Ash seedlings should be raised in a situation pretty much exposed, to prevent their being too much drawn up.

Sowing Hollies.

If the sowing of Holly seeds has been omitted in September, it ought now to be done. The best situation for raising Hollies is such as has not the force of the mid-day sun to encounter. The ground should be friable and rich. They should be sown in beds, as recommended for haws, and about the same thickness. The covering should not be more than half an inch thick. It is especially necessary not to sow Hollies too thick; because, if the seeds have been only one year rotted, many of them will rise only the following spring, and if they come up very thick the first year, those that are to rise the second will not easily get through.

Sowing Mountain-Ash.

If any roan-berries remain in the rot heap, they should be forthwith sown. The soil most proper for Mountain-Ash, is such as is fine and pretty rich. The bed form is the best. The covering should be only a quarter of an inch. Great care should be taken not to sow too thick; the seeds of this kind are generally very good, so that they often come up double the thickness that will allow good stout plants to rise.

Sowing Yews.

Yews like all the other seeds in the rot heap, should rather be sown in September ; but if they have remained unsown, the present season will answer pretty well. The situation for Yews is such as we have above recommended for the Holly. They may be sown about the same thickness, and covered half an inch.

Sowing Acorns.

The soil most proper for the sowing of Acorns is a strong loam that is in good heart. Either the bed or drill form, as above recommended for haws, will answer completely. In preparing the land, care must be had to break it well in the digging, and to make it moderately fine by a pretty wide-toothed rake : The covering should be two inches thick. The Acorns, if good, should be placed about half an inch apart when sown. Too thick sowing is very injurious to the coming crop ; and is therefore even worse than throwing away the extra seeds. It has elsewhere been shown, that Acorns from tall healthy oaks, such as are more generally to be found in England, are to be preferred to such as are produced by stunted ill shaped plants. Hence we wait with patience till this time of the year, for a supply of

proper seeds in Scotland. Had we, however, the seeds at an earlier period, or even from the tree, they would be more properly sown in the autumn; at which season, of course, they should be sown in England.

Sowing Spanish Chesnut and Horse Chesnut.

If the supply of Horse Chesnuts and Spanish Chesnuts be come to hand, they may now be sown. The same quality of soil above recommended for acorns will answer well for them, and the same depth and thickness of sowing and of covering. They may be sown either in the bed or drill form, according as taste or necessity may direct.

Sowing Hazel Nuts.

If these be sown in the early part of this month, a great part of them will rise the first season; but if the sowing be much deferred, they will lie till the following spring before they rise. The same quality of soil, and manner of sowing as above recommended for acorns and chesnuts, will answer for them. They may be sown rather thicker than these.

Sowing Gean Stones.

The Gean stones which have lain in sand since autumn, should now be sown. The bed form is the best. The soil most proper for them is a deep sandy loam. It does not require to be very rich; but should be well worked to a good depth before sowing. The covering should be three quarters of an inch thick. Great care must be taken not to sow too thick, as many of them will probably lie dormant till the following spring; consequently, these would be lost if they were too thick, as they are generally allowed two years in the seed-bed.

Sowing Hornbeam.

The sowing of the Hornbeam is more properly performed in October: In Scotland, as we have the seeds to fetch from the south, we can seldom get them sown before this month; the consequence is, that many of them lie in the ground till the following spring, without vegetating: The soil most proper for them is light earth, not over rich:—the bed form will answer best; the covering should be half an inch. They should not be sown too thick; if the seeds are good they should lie half an inch apart, after sowing.

Sowing Walnuts.

Walnuts which have been kept in sand during winter should now be sown in beds, or planted in rows, in angular-made drills ;—the covering should be two inches thick ;—the nuts should lie two inches apart. They seldom rise well, so may be found thin enough ultimately, though planted or sown only at two inches apart. The land most proper for them, is a rich deep loam. They should be lifted the first year after sowing.

PROTECTING THE NEW SOWN SEEDS FROM BEING
DESTROYED BY VERMIN.

New sown seeds of many kinds are the prey of various creatures.

Acorns, Sweet Chesnuts, Hazel-nuts, Walnuts and Holly seeds, are greedily devoured by mice. They not only eat them on the spot, but they carry to their retreats, great numbers of the seeds of which they are most fond. Means must therefore be used to destroy these vermin, otherwise the crop may be very much injured. The cheapest, and perhaps the most effectual trap, is what is pretty generally known under the name of *the fourth figure* *.

* Represented in Plate III. Fig. 5. This kind of trap is well known to most nurserymen and gardeners ; yet to some, a description of it may be necessary, it being a useful and

The new sown Haws and Mountain-Ash berries, are a prey to the chaffinches, green linnets, and

easily procured means of destroying mice. It is composed of three narrow pieces of wood, so formed, as to present pretty nearly the figure 4.

The longest of these pieces of wood, or the *bait-stick* (*a*), should be seven inches in length, half an inch broad, and one-sixteenth thick; the outward end on the upper side is notched to one-fourth of its thickness, at half an inch from the end. Two and a half inches inwards from the last mentioned notch, holding the above end from you, there is a cut made on the right side to half the breadth of the stick, from which, towards the outer end on the same side, a little within the first mentioned notch, the wood is cut out in a circular manner. The inner end is tapered and left rough, in order to make the bait (at *b*) hold the better upon it. The *upper piece* (*c*) is three inches long, half an inch broad, and one-sixteenth of an inch thick. At half an inch from what is to be the highest part of the trap, it is to be notched, like the outer end of the bait-stick, to one-fourth of its thickness; the other end is made sharp like the face of a chisel. The third piece is of the same thickness and breadth, and four inches long, sharpened at one of its ends like the above, and cut square at the other. This piece is called the *pillar* (*d*).

There are two slates required; one to lie upon the ground, and this must be pressed so deep into it, as to cause its upper side to be equal with the general surface; because, if access to the bait is any way difficult, the mice will take the seeds as the readiest food, although not perhaps the most palatable. Having laid the above slate, and being provided with another, from six to seven inches square, and from one and a half to two pounds weight, take the *upper piece* (*c*) into the left hand, holding the sharp end towards you, and the notch downwards. Next, place the sharpened end of the *pillar* into

other birds. If the quantity sown be not great, the beds may be hooped over, and covered with small-meshed nets. But if a great breadth of ground be sown, it must be constantly watched after sowing. If the watching be vigilantly attended to, for a few days immediately after sowing, the seeds will not need much more attention till they begin to break the ground ; at which period, the watching should be closely and regularly continued. As they are always the strongest and best ripened seeds which rise first, it is therefore of much importance to prevent these from being picked up.

this notch, forming an acute angle ; hold these two pieces in this position with the fingers and thumb of the left hand, and place the under end of the pillar upon the lower slate, and the outer edge of the upper slate near the extremity of the upper part of the trap ; then take the bait-stick (previously baited) with your right hand, and place it so, that the notched part near the extremity may receive the sharpened end of the upper stick, and let that place of it which was cut half through hold the *pillar*, but so as that the baited end of the bait-stick may slightly rest upon the slate ; and the trap is set.

A very little practice will enable any person who is a stranger to this kind of trap to use it with facility ; and a great number may be placed in the nursery grounds at no expence. Bricks are sometimes used in place of slates. The best bait is oatmeal made into dough by butter, and tied on the bait-stick with a little flax : After being tied on, it will be of use to burn the bait a little, to make it smell. Such a quantity of bait must not be used as may prevent the mouse from being killed by the fall of the slate.

It is to be remarked of the Elms which were sown last June, that by the pulling out of such as have vegetated, the remaining seeds become much exposed : they should therefore be attended to, both in regard to mice and birds. The latter are uncommonly fond of Elm seeds at any time, but more especially when they are just breaking the ground. Particular attention must therefore be paid at this crisis.

CUTTINGS, &c.

Propagation of Elder.

The speediest way of propagating Elders, is by cuttings. These should be taken from the last year's shoots, and cut in such lengths as to allow at least one pair of *eyes* or buds below ground, and one pair above. They should be planted in rich moist land, at eight inches between the sets in the rows, and eighteen inches between the rows. This width is necessary for the Common, the Red-berried, and the White-berried, because they grow up very strong ; and it is seldom that any of the cuttings of these fail to *take*. The other varieties, such as the Gold-striped, the Silver-striped, and the Cut-leaved, require less room at the first, because they do not make so strong shoots.

Elders may also be raised from seeds. The berries may be sown immediately after being ga-

thered in autumn ; or they may be kept till this time in sand, and sown in a bed of light rich soil, and covered a quarter of an inch deep. They should be sown thin, as they generally rise well.

Propagating of Poplars.

Most of the kinds of poplars are propagated from cuttings. The Black Athenian, however, the Woolly-leaved, and some other varieties, succeed only by layers, in the manner of Limes. The best cuttings of Poplars are taken from the thick end of last year's shoots. They should be at least nine inches long, so that a good shoot of last season will afford two good cuttings. The soil best adapted for these, is such as is above recommended for the Elder. They should stand at six inches between the sets in the lines, and at eighteen inches between the lines, leaving only two inches above ground when planted.

Propagating Willows.

All the kinds of Willows may be easily propagated by cuttings. Such as are intended for being rooted in the nursery, should be taken from the firm wood of last-year shoots. The cuttings should be nine inches long, and planted as above directed for Poplar cuttings.

The soil best adapted for *striking* Willows, is such as is above recommended for the Elders and

Poplars. Willow cuttings, however, which are to be planted at once in the field, to yield rods for baskets, hoops, and the like, may be taken from two-year old wood, and formed into cuttings of about two feet long, sharpened at one end. This method is perhaps rather objectionable, from the vast quantity of Willows thus required to plant any considerable extent; hence the cuttings are generally taken from the one-year shoots also, and are formed into sets of only a foot long. These answer pretty well. In planting in the field, they should be pushed in, so as to leave four or five inches above ground. In the nursery, however, if there be two inches above ground, it is sufficient.—Directions as to preparing for and making plantations of Willows, both for hoops and basket-work, are given in the Appendix No. I.

OTHER WORK TO BE DONE IN THE NURSERY.

Continue the digging between the lines of such trees as are intended to stand for another season. This work must all be performed in the course of the month. All weeds should be removed from such places as are not to be dug, that these enemies may not get too powerful.

Such places as are destined for receiving Fir seeds, should be dug and laid up as rough as possible, in order to prepare the soil the more completely for the intended crop.

Where the pruning of any deciduous trees has been omitted, it should be forthwith done; but on no account should a knife be put upon the Sycamore, or the Birch, at this season; for they would probably bleed to death. Indeed, the pruning of any trees should not be carried on after this month, till, at soonest, the first of July.

If the Lime-tree and other layers which were taken off in October or November, are not planted out, it should be forthwith done. If it be delayed beyond this time, the future growths will be much the worse for the first year at least. If there are seedling Limes to plant out, they should not be delayed any longer. Few trees take worse with very late planting than the Lime, either in the character of layers or seedlings.

If a sufficient quantity of Fir or Larch cones have not already been procured, this should now be done: It will not be proper to defer it beyond this month, because other very pressing business in the Nursery will henceforth require the whole attention.

ORNAMENTAL PLANTATIONS.

PROBABLY, by this time, the most of the ground intended for Ornamental plantations, will be in a fit condition for receiving the plants. It is presumed, that the preparation of the land by some of the methods previously recommended, has been completed. If, however, any of that under fallow requires a furrow to prepare it finally for planting, it should receive it as soon as the weather will permit.

ESTABLISHING AN ORNAMENTAL PLANTATION IMMEDIATELY UNDER VIEW OF THE MANSION- HOUSE, &c.

Supposing that the grounds are neither too wet nor too dry for commencing the operation of planting, and that all is ready ; allow us to interpose a caution. Keep constantly in mind, that you are about to plant for ornament ; that the plantation which you are about to make will be continually in view ; and that a tree of an uncommon variety, which would have been an ornament in its proper soil and situation, will, if placed in a soil and situation improper for it, be a wretched deformity,

and a testimony of the ignorance and incapacity of the designer. Avoid, therefore, putting in such kinds as are not properly adapted to the soil and situation. It is a thousand times more agreeable to see a fresh growing healthy Scots fir, than any of the finer kinds of foreign trees in a stunted, unhealthy state. If, therefore, you do plant the more delicate kinds of trees in an unpropitious soil, take the trouble of introducing a portion of better soil round each plant, as advised for hedge-row trees in last month; and you will thus prove yourself a workman that needeth not to be ashamed of his labour.

If the ground, for the purpose presently under view, has been prepared by trenching, perhaps twenty inches, or two feet deep; and if the bottom be dry, and the soil of a good quality, there are few kinds, either of useful or ornamental trees, which may not be introduced.

The skirts of such a plantation, if of a considerable depth, should be embellished with shrubs. The dwarfish kinds should be placed next to the verge; the taller sorts should recede inwards till their tops lose themselves among the lowermost branches of the body of the plantation. The body of such a plantation may consist of Oaks, or of Spanish Chesnuts, or of Beech, or of Larch; or it may consist of a mixture of all these; in which case, the Larches chiefly should occupy the skirts of the wood, with here and there an evergreen fir;

a Silver-fir above all others, increasing the proportion of firs, inwards, until they be, as it were, lost in the darkness of a forest.

If circumstances demand that the plantation be more narrow and confined than the above, it will fall under the description of an Ornamental *Screen* Plantation.

SCREEN PLANTATIONS.

Screen plantations, of the preceding description, require to be formed with peculiar attention, not only to the present, but the future. We must here anticipate what will be useful, pleasing, and beautiful, for a great many years to come, and dispose of our trees accordingly. The taller growing kinds, as the Oak, the Elm, the Chesnut, and the Ash, recede farthest inwards. The Firs should recede from, or approach the view, according to the darkness or lightness of their tinge; but the farthest removed part of the plantation, or stripes, if at some considerable distance, should contain a good proportion of tall growing firs, such as the Silver or the Scots; with fewer Larches till nearer the skirts, which, like the preceding, should be of shrubs.

Having fixed upon the kinds fit for the principals, the next consideration is the *Underwood*. The kinds most fit for this purpose are, the Holly, the Yew, the Common Laurel, the Spruce Fir and

the Common Furze, as evergreens ; the Hazel and the Hawthorn as deciduous ; and for those of the higher order, supernumerary Spanish Chesnuts, Elms, and Mountain-Ashes, may be planted, which may be headed down, as circumstances may require. The necessary underwood will diminish the number of the nurses to about half the number that otherwise would have been required. The tallest growing underwood should be placed farthest inwards ; those more dwarf, nearest to the shrubs on the margin ; the tallest growers of the shrubs next to the trees ; so that a complete screen from top to bottom may be formed, which may continue to be of use in that way for any length of time.

The space of this plantation, as well as that of the foregoing, principally occupied with forest trees, must be supplied with a proper proportion of *nurses*, either of Larches or Firs, as circumstances may direct. The distance of the principals, in both cases, ought not to exceed nine feet.

Narrow stripes of planting, round small estates, should all be, in some degree, screen plantations.

In planting such, there ought to be a good number of underwood plants introduced at first, which would secure the good effects of shelter, and take off the naked appearance which such stripes otherwise assume.

Screen plantations of firs removed to a considerable distance from the principal view, produce

a pleasing effect. Such, however, if the breadth will admit, assume the character of *Groves*, and should be treated as such.

In unpropitious soils, and bleak situations, where it is nevertheless necessary to raise wood for beautifying the adjoining grounds, the nature and quality of the soil must be studied, and only such kinds introduced as will, with certainty, grow well. If experimental trees are at all used, let it only be where the nurses would have stood, and that, too, with a sparing hand.

PLANTING OR FORMING GROVES.

It has already been observed, that a grove is a plantation of trees, whatever be their kind or kinds, which are intended to be trained up with straight tall trunks. This circumstance will partly determine its extent. If the eye can penetrate through a plantation, it produces a feeling of nakedness. A grove, then, should be of such an extent, or so particularly situated, that, from no side shall the eye be able to penetrate to the other, even were the trees arrived at their full stature, and properly trained. This circumstance shows also the propriety of removing the situation of the grove to a considerable distance from the site of the mansion-house: It would be no mark of an improved taste to narrow the prospect, by placing a grove in an improper direction.—For further

information on this article, see the article *Groves* for last month.

Groves may be constituted of a mixture of trees, like ordinary mixed plantations, but more properly in masses; in which respect, they may be considered as ordinary plantations formed in masses. Indeed, they differ from them hardly in any thing, excepting that the principals are to be placed rather more closely together. The principals of a deciduous grove should be placed at the distance of six feet; and the interstices filled up with nurses of larch or firs, till the trees in the whole grove be only from three to four feet apart.

Groves may be formed of Larches alone. A grove of larches of good extent, properly trained, produces a grand and pleasing effect. Larches planted for a grove should stand, in the first instance, at the distance of three feet and a half apart. If the land be tolerably good, they may be planted in the T method like ordinary planting. After pitting, fallow, or trenching, they will doubtless grow more vigorously for the first five or six years; but, after ten or twelve years, they are not to be distinguished from those planted in the other way.

Groves, when composed entirely of Fir, of any of the kinds, have a better effect, when placed in proper situations, than when firs are mixed with other kinds;—and, when thus separate, they are more easily managed, and produce finer timber

trees. Although we have here mentioned groves of fir trees, we do not intend to advise the planting of them at this time. It has elsewhere been noticed, that *April* is a more fit season.

All the sorts of Deciduous plants, if the land be in a proper state, should be forthwith planted.

MANNER OF PLANTING.

Such lands as have been prepared for any of the above descriptions of plantation, by trenching, by fallow, or by digging, require only that a spadeful of earth be lifted out where the tree is to stand, sufficient for holding the whole fibres of the roots in an easy, horizontal position; and, at least, as much under the surface as when in the nursery. The earth is to be *trindled in* among the fibres, and the plants properly set, and treated in all respects as advised for *Forest Plantations* for last month; which see.

SIZES OF PLANTS.

The sizes and ages of the plants to be used must be regulated by the nature and exposure of the land, its mode of preparation, and the like. For trenched, fallowed, digged, or pitted ground, as observed under the article *Forest Plantations* for last month, they should not exceed eighteen inches or from a foot to eighteen inches in height.

Nurses of larches or Scots firs, which are to be *slitted in*, should be small plants one year nursed. In a piece of trenched land, however, which is rich and very well sheltered, plants of a larger size, which have been properly prepared in the nursery, may be planted. Plants of from three to four feet in height, provided they have good roots, with numerous fibres, will succeed well under circumstances like the preceding.

We have even mentioned plants for hedge-row and detached trees, in the park and in the lawn, of from four to eight, or ten feet in height; but the expence of preparing these in the nursery, and of removing and planting them, is a sufficient argument, were there no other, against their general use: . But when we know from experience, that such seldom or never make so vigorous trees as those that are transplanted at an earlier period, the preference is justly given to young plants.

PLANTING HEDGE-ROW AND DETACHED TREES.

In all situations where the soil is in a proper state for planting, it should forthwith be done. The most proper hedge-row trees, are the Sycamore, the Beech, the Ash, the Scots Elm, the English Elm, and the Oak where the soil is suitable. These may also be allowed a place in the park or the lawn, with the addition of the Lime, the Service, the Spanish Chesnut, the Prolific

Chesnut* ; the Gold, the Silver, and the Weeping Ash ; the Striped Sycamore, and the Copper Beech ; the Common and the Double flowering Thorns. The Common Holly and varieties ; the Portugal† and Common Laurel ; together with the sombre Yew, when properly disposed in the lawn or the park, either in single trees or in groups, and judiciously contrasted, afford a pleasing variety to the eye, and give an air of liveliness and grandeur to the *place*, unknown where such are absent.

After what we have said in *January* respecting the preparation of pits for these, we need hardly again inculcate the propriety of bringing a portion of good soil, if necessary, to encourage the intended occupier in its progress ; or repeat, that the pits for receiving detached ornamental and hedge-row

* An early-bearing variety, introduced by the ingenious Mr Knight.

† The Portugal Laurel, by proper management, may be formed into an elegant *tree* for the park or lawn, and get quickly to a considerably size. A number of Portugal laurels were planted in 1787, at Raith in Fifeshire, which now, in 1819, are fine trees. One of them at two feet from the ground, girths three feet eleven inches. Another at the same height, four feet one inch, and at the surface of the ground five feet two inches. Another at two feet from the ground girths four feet, and at the surface five feet one inch. These have every promise of making very stately trees. It may be useful or remark, that this plant accommodates itself to most soils. Those above noticed, grow upon a light soil, incumbent on a quick sand, at two feet depth.

trees should be made eight or ten inches wider, and two or three inches deeper than necessary for holding the roots of the trees to be planted in them, in order that they may be the more effectually encouraged in their growth.

FOREST PLANTATIONS.

IN the preceding month, when contemplating an extensive plantation consisting of a variety of soils and situations, we strongly recommended the *massing* system ; because we thus have it in our power more perfectly to adapt each kind to its own natural soil and situation, and thereby lay a better foundation for health and vigour in the plants, and consequently secure far better timber in a shorter time, than can be procured by the ordinary mixing plan.

Last month we recommended the planting of dry portions only ;—by this time a greater quantity of the land will be in a fit state for being planted, especially such parts as are most likely to be adapted for masses of Elm, Ash, Sycamore, Beech, Spanish Chesnut, and Larch ;—the other portions of the grounds more clayey or damp, may lie off for the reception of the Oak, the Birch, the Pop-

lar, and the Willow. Early planting, on elevated, dry situations, which are much exposed to parching droughts, is the surest means of securing the growth of the plants. In this climate, and particularly in Scotland, we can depend with certainty on having abundant rains, at short intervals, during this month and March, and even April. But beyond that till June, we not unfrequently have severe parching droughts. If the trees are not planted till late, on dry places, the chance is, that their destruction will follow. Even the ever-green sorts (the firs) should be planted sooner in the season on these places, than in such as have less chance to be parched.

We need not here mention any thing of the distances at which the principals should be planted, that being previously determined in the pitting of the ground.

It is presumed that none of the ground which has been pitted for the principals, will be too bleak or exposed at this season for their reception. The earliest opportunity for planting the Larches should be embraced: because they are of very early growth, and are most impatient of being removed after they have begun to grow: However, this circumstance should not lead to planting them, while the land is in too wet a state. It has already been noticed, that Larch nurses may, with propriety, be *slitted in*, or planted after preparation

by the mattock, provided proper plants be used, *i. e.* strong one-year seedlings one year nursed, or weaker two-year seedlings nursed the same length of time.

There is not the least occasion, as elsewhere shown, to pit the ground intended for masses of Larches. Plants of the above age and nursing, planted after preparation with the mattock, will be found to outgrow larger plants planted after pitting.

PLANTING NARROW STRIPES OF FOREST TREES.

Although we are against the planting of narrow stripes of Forest Trees, they are in many cases indispensable. Round a small park, in the neighbourhood of a town, where it is required to cover a variety of disagreeable objects; or on the boundaries of a small estate, perhaps from fifty to a hundred acres, which is in a high state of cultivation, they are very necessary. These stripes should, however, if possible, never be narrower than twenty-five or thirty feet. It would be preposterous, in this case, to attempt *massing*. Small groups, however, according to the circumstances of soil, or situation, may be planted. But it would be advisable to choose a good proportion of the principles of such plantations, from the sorts which are known to arrive at greatest perfection in exposed situations; such as the Sycamore, the Beech,

the Mountain-Ash, the Ash and the Elm. Stripes of the above description should never be planted, without a good proportion of underwood plants ; such as Holly, common Laurel, Hazle, and the like. By the proper arrangement and management of such trees and underplants, narrow stripes may be made very useful, both for shelter and screen.

It would be superfluous here to repeat the distances, and manner of planting ;—these subjects having been treated of at large under this article for last month.

PRUNING FOREST PLANTATIONS.

This work may be carried on during this month on every species of tree, excepting the Sycamore and the Birch. These, however, must not now receive a wound ; because they bleed excessively, and sometimes die when pruned so late in the season. The same may be said of the Gean ; see *January* under this article on that subject. The pruning of no kind of forest tree should be carried on beyond this month ; because every one of them, at the rising of the juices, bleeds, less or more, at recent wounds. Hence the advantage of autumn-pruning above that of any other season. When pruning is performed in autumn, the wounds become dead, and incapable of transmitting the juices to the surface : So that the plants lose none of their natural strength. The above observations

hold in an especial manner in the resinous kinds. Pruning ought therefore to be suspended, from the end of February till the middle or end of July.

THINNING PLANTATIONS.

The Thinning of Plantations may still be continued: Indeed, excepting for the injury which the living trees may sustain, by the removal of such as are felled, the Thinning might be continued during the summer months, as well as at any other period of the year.

This is the most proper season for thinning out masses of Birch, Black Poplar, Huntingdon Willow, Bedford Willow, and Spanish Chesnut; because they will now part easily with the bark, which is to be taken off, and prepared for tan, like oak bark. Throughout the whole of the mixed plantations, the thinning out of the above kinds, ought to be deferred till this time, that the advantages arising from the bark may be the more easily secured. The method of taking off the bark from the above, is the same as that for taking off oak bark, which will be found described under the article *Oak Woods and Copses* for May. While, therefore, the thinning out of the above kinds is to be suspended till this time, that of the oaks is still farther to be deferred till May; because, at that season, owing to the flow of the juices, the thinnings, or felled trees, are most easily barked.

WOODS AND COPSES.

PREPARATION OF THE GROUND.

THOSE grounds intended for Oak Copses, from seeds, and which have been under fallow the preceding season, may still require a furrow previous to that for sowing the seeds. This will be especially necessary, if the surface be much battered and flatted down by the winter rains.

Lands intended for this purpose, which were under a crop of oats the preceding season, in order to rot and reduce the sward, and which are lying in the furrow which they received after the removal of the crop, ought now to be cross-ploughed, as the best means for reducing and meliorating the soil. It may lie in that state, and be harrowed down in March. But if the land has been under a rotation of corn and green crops, has been last season under oats, and has received a furrow after the separation of the crop from the ground, and if it remain tender and clean, it will require nothing more till it receive the seed furrow in April. If, however, crops of vegetables, or green crops of any kind, be intended to be taken from any of the above grounds, they must receive a dressing of

dung to enable them to produce such in perfection. It is a matter of considerable importance to have this ready at the side of the field by the time of sowing, lest the necessary operations should be hindered by procuring it from a distance.

Those lands which have been pitted for woods and copses, require nothing at this season, excepting, perhaps, the letting off of standing water from low grounds and hollows,—the souring of pitted land, or indeed any land, proving highly detrimental to the vegetation of the seeds afterwards to be sown in it.

PLANTING NURSES.

It is now a proper season for planting larch nurses. In craggy and elevated grounds which were pitted in May last year for the sowing of Oak copses in April this year, the nature of the soil evidently points out, that the best mode of preparation is by the mattock. If the land be stirred to a good depth, the plants thus set will succeed nearly as well as if the land had been pitted: And the preparation by the mattock will not cost one-half of the sum that pitting would have amounted to. In most cases, when preparing by the mattock is resorted to, the plants may be put in by the *Planter* *. By the use of this in-

* The *Planter* is figured in Plate III. fig. 2. and described in page 20.

strument, one person may plant nearly as many as two by the spade, in such uneven ground. The person carries the plants in a close apron, digs out a portion of the earth sufficient to hold the roots of the plant, and finally sets and firms it, without the aid of a second person. It will readily occur to the attentive reader, that small plants only can be planted by this instrument; indeed such only are proper for situations requiring preparation by the mattock.

PLANTING MIXED COPSES.

The season is now arrived when the most of this work may be performed. Anxiety, however, should never be allowed to drive us to plant when the ground is in an unfit state. It is a more rational and a safer plan to descend to the lowest grounds in the planting as they begin to dry. It only requires a small addition of labour; which, put in competition with the success of the plants, is nothing. But, under this article for *January*, we have given directions in this respect, as well as in regard to the kinds, the manner of planting, and introduction of the nurses; to which, to prevent repetition, we beg leave to refer the reader.

PRUNING WOODS AND COPSES.

As in Forest plantations, the pruning of Copses may still be carried on, excepting copses of Birch,

which, as before stated, must not be wounded at so late a period of the season. The pruning of coppice wood cannot be considered as differing so much from the pruning of ordinary plantations, as to require any distinct directions. We therefore refer the reader to the article *Pruning Forest Trees* for last month.

THINNING WOODS AND COPSES.

This is now a proper season for thinning out all the coppice kinds, for barking ; save the Oak, which should remain untouched till May ; where directions for taking off, and drying the bark will be given. The thinning out of the nurses, in this description of plantation, will fall under the same management with ordinary Forest plantations of equal ages ; we therefore refer the reader to the article *Thinning Forest Plantations* for January.

FENCES

FENCES.

QUICKSET, or Thorn fences, may still be made with great propriety. The best methods have been treated of under this article for last month.

The work of plashing and cutting down neglected hedges may still be carried on during this month; although it may not be advisable to carry such operations much beyond it. It is extremely prejudicial to all deciduous plants to be lifted after the sap begins to flow. The lifting of thorns ought therefore to be suspended from the middle of March till the autumn months.

If any hedges have been neglected to be switched, it must not be delayed any longer. This is by no means the best season for such work; but, were it left undone till autumn, the hedge would be much injured.

MAKING AQUATIC HEDGES.

We may here remark, that Aquatic Hedges are often of very great utility in fencing and subdividing low wet grounds and meadows, and for forming screens and shelter in damp situations, where the hawthorn would not grow.

The most proper plants for forming such hedges are, the Birch, the Alder, the Elder, the Willow, and the Poplar. Seedlings of the two former kinds are required; the latter may be reared from cuttings inserted in the places where they are intended to grow.

The plants of Birch and Alder *, which are most proper for being planted out, are one-year seedlings one year nursed; these should be planted without being cut down. Both Birch and Alder may be laid after ditching, as directed for Thorn Hedges in last month. Nevertheless, they may be also planted upon the surface, without any ditch.

The other sorts may be planted on the surface, or after ditching, with equal propriety. If, however, they are to be planted upon the surface, without any ditch, the land should be properly prepared. The best method is by a light trenching: paring off the surface, and burying it under a good deep *spading* of earth, will be generally sufficient. The surface should be made pretty smooth, and the cuttings thrust perpendicularly down, (if it can be done with safety to the sets,) along the side of the line, to within three or four inches of the top. The distance at which these should stand, to form good thick hedges, is, for the

* The Alder is also propagated from cuttings, but with less certainty than the other sorts. For this reason, we recommend planting Alder hedges with rooted plants.

Elder, nine inches ; for the Poplar, nine inches ; and for the Willow, six inches : The cuttings, which are to be planted on the surface, as above, must be made sharp in the thick end to be pushed into the ground, that they may be planted with the greater ease. If, however, any of the three sorts are to be planted after ditching, the cuttings will require no preparation of the kind ; but are to be laid as if they were thorn plants.

Some writers recommend the thrusting in of all cuttings of the sorts above mentioned. But this is often attended with danger to the cuttings ; the bark being sometimes pushed off by the hardness of the land. If there is the least danger of this, they should be planted with the iron-shod dibble, in the ordinary manner of planting in the nursery. The cuttings of all the above sorts for the present purpose, ought to be fifteen inches long, and taken from the firm wood of last year's shoots. Care must be had not to use the small soft part of the shoots of any of the kinds ; because such always produce weak plants, which might cause gaps in the fences.

OTHER KINDS OF FENCES.

The fencing of plantations with drystone and Galloway dikes, should be carried on with all speed.

Towards the end of the month is a good time to begin to build sunk-fence walls, and other di-

vision walls, with mortar : In respect to the preparation of which, see the article *Stone Walls* for *March*.

A sufficient supply of paling stabs and rails should be provided for defending new planted hedges. These should be forthwith erected. Those of former erection should be mended and secured, wherever they may require reparation. In short, all the fences should be put in a proper state of repair as speedily as possible.

Such grounds as are intended to be fenced with a ditch and whin hedge, as noticed last month, may now be prepared for receiving the seeds next month ; which see.

MARCH.

March.

THE NURSERY.

CONTINUE the laying out of seedling Thorns, Larches and Elms, if not previously done. The work of planting out seedling plants of early growth ought not to be delayed beyond this time, on any account.

If any one year or two year seedling Ash, Oak, Beech, or the like, remain unmoved from the seed-bed, they should be lifted and *shoughed*, as directed last month.

When the nursery runs short of any of the kinds of seedlings, and they must be brought from a distant nursery, never allow them to remain in the bundles in which they come tied up; but have them instantly shoughed when they arrive. Even if it be intended to plant them out in a few days, this *shoughing* should be attended to; for such a change of weather may take place as may prevent the planting for some time longer, greatly to the

injury of the plants, especially if they be very dry. The experience of every season points out the destructive effects of not attending to this precaution.

Elder, Poplar, and Willow cuttings, must now be provided and planted out. If circumstances render the planting of them at this time impossible, they may be stuck singly into a spot of very damp soft earth, where they will remain safely for two or three weeks. Cuttings so treated, send out their young roots probably before they can be removed : in which case, care should be had to plant them out in damp, or even rainy weather ; because the young fibres are unable to endure the violence of spring droughts. When such cuttings are to be lifted for planting, they should be eased with the spade, in order to preserve every root entire.

PLANTING SEEDLING BIRCHES AND ALDERS.

The Birch is of very early growth, and requires to be attended to immediately. The proper soil for Birches, as has already been hinted, is such as is finely parted and mossy. They ought not to be committed to land of a clayey nature in their infant state ; they will do pretty well in a soft sandy earth, but not near so well as in their natural loose and mossy soil.

What is above said of the Birch, applies also to the Alder, the same soil and treatment being requisite.

The distance at which Birches and Alders should be planted, must, as in the case of other seedlings, be regulated by the age and size of the plants, and the time which it is intended they should be nursed. Two-year seedlings of good growth, which are to be nursed for one year, should stand fifteen inches between the lines, and five or six inches apart in the lines. One-year seedlings, to be nursed one year, should be twelve inches between the lines, and four inches apart in the lines. But if intended to be nursed two years, the same distance is required as is assigned above for the two year seedlings.

A natural Birch or Alder soil does not require so much manure to enable it to nourish these, as is necessary in most cases for other soils. Nevertheless, it is very improper to commit young Birch or Alder plants to a soil which, though apparently congenial, has been previously exhausted by a heavy crop of trees, without a good dressing of well made stable dung: This should be well intermixed with the soil in the act of digging.

SOWING SEEDS.

It often happens, particularly in Scotland, that various tree-seeds, ordered from London and other places, do not arrive at the nursery till this month.

This is frequently the case with acorns, horse-chesnuts, Spanish chesnuts, hazel nuts, horn-beam seed, and walnuts. If these be now arrived, they should forthwith be sown.

Sowing Elms.

The Elm seeds, which were gathered in the latter end of last June, may now be sown. There is, however, great danger in risking the whole at this early season ; indeed, it is not necessary, as what was sown last June, will be an early crop. It frequently happens, that the early vegetating elms are cut off by the spring frosts. It will therefore be safer to sow, perhaps, the half at this time, and to reserve the other half for April sowing. Those late sown, although they will not be so strong plants by autumn, as if they had been sown earlier, and had escaped the frost, yet will prove a security against a total want of the article, which many have experienced by not attending to this precaution.

The ground most fit for sowing Elm seeds, is such as is tender and rich. If it has been under a light crop of vegetables last season with dung, it will answer the better. The best crops of vegetables for preceding tree seeds of any kind, are such as are not apt to leave any remnant to dirty the ground during the summer. Hence, potatoes are very improper as a preparing crop ; but lettu-

ces, spinage, onions, turnips, or the like, are very proper.

If the Elms be intended for two-year seedlings, which in most cases is the preferable age, they should be sown very thin, in order that the plants may rise stout and vigorous. If they rise too thick the first year, they are for several years after sensibly affected, continuing weaker, although carefully thinned out.

The best form of sowing Elms is in beds, as previously advised for haws in last month. The covering should not be more than half an inch thick.

Sowing Laburnums.

Laburnums, both the tree and the shrubby sorts, being very hardy, may now be sown. There is no plant more liable to be hurt, by thick sowing, than this. The seeds are generally good, and consequently sure growers. When they rise very thick, they lose their leaves about midsummer, become mildewed, and die.

Laburnums of neither of the sorts should be sown to rise nearer to one another than an inch; and if they are intended for two-year seedlings, as they generally should be, this distance is too little, and may be increased to an inch and a half.

In *October*, which is the time of gathering these seeds, we shall point out the necessity of keeping

the tree and shrubby sorts separate ; and the same care should be continued to sow and plant each kind by itself, for fear of mistakes.

The land most proper for *Laburnum* seeds, is such as has above been recommended for elms. The bed form is the best, and the covering should be three quarters of an inch thick.

Sowing Sycamores.

Sycamores, like elms, are very liable to be killed at the *briering* by late frosts. It would therefore be proper to sow only one half of the seeds at this time (towards the end of the month), and to reserve the other half for April sowing.

If Sycamores be sown in rich moist land, they will rise so tall and soft, that not one of a thousand of them will have a whole top, and of course will be little worth.

The land most proper for sowing Sycamore seeds in, is dry exposed sandy soil, by no means rich. If they can be raised three or four inches high, with whole tops, in the first year, a thousand of these are worth twenty thousand of such as are a foot or eighteen inches high with bad tops.

Sycamores should not be sown thick ; if they rise an inch apart, it is abundantly thick for one-year seedlings : and if intended for two-year seed-

lings, they should not rise nearer one another than two inches.

Sowing Birch and Alder.

This is now a proper time for sowing Birch and Alder seeds. We have several times had occasion to notice the quality of soil most suitable for these. The land should have been under a preparing green crop, or fallow, the preceding season, and previously dunged, that the manure may be well incorporated with the soil before sowing.

The land must be carefully digged, and particularly broken, from top to bottom, in the digging. The raking also must be performed with great attention to make the soil very fine. It is scarcely possible to cover Birch seeds too little, if they be covered at all. It need hardly be observed that a calm day should be chosen for sowing birch seeds, as well as for all others that are light.

The preparation for Alder seeds is the same as for the Birch: the covering, however, ought to be a quarter of an inch thick; and the bed form for both kinds is the best. Although we here recommend the sowing of the Birch at this time, it may also be sown from the tree in the end of August or beginning of September. But such rise sometimes too early for a Scots climate: It is proper, therefore, to reserve the principal part of the sowing till about the first week of April. It

is difficult to say how thick Birch and Alder seeds should be sown, it being no easy thing to know their quality. It is better, however, to sow pretty thick, and to thin them out the following spring, if necessary.

Sowing Beech.

The Beech, like the sycamore and the elm, is very liable to be killed by late frosts in the spring. It will therefore be proper to withhold the sowing of a part of the beech-mast till the first or second week in April. There is danger, however, in keeping it longer out of the ground than the middle of April: For if severe drought set in, it will not rise till the following spring, and so have a great chance of perishing by the frost.

Beech-mast should never be sown in poor land. The soil most fit for it, is such as we have described as fit for elm seeds: only the land for the beech may receive a dressing of small dung previous to the sowing of the seeds. Care must be had not to sow the seeds too thick, especially if intended for two-year seedlings. If the seeds are good they should not lie nearer to one another, when sown, than an inch. The bed or the drill form may be adopted at pleasure. The covering for beech-mast should be a full inch thick.

DESTROYING VERMIN.

According as the sowing of seeds in the nursery is increased, so will the care to preserve them from destruction by mice and birds require to be increased. New sown elm seed will be greedily sought for by the birds, and the beech-mast by the mice.

**PREPARING VACANT GROUND FOR GREEN CROPS,
&c.**

In the *Introduction*, the advantage of a nursery being occasionally used as a kitchen garden, has been mentioned. In all cases, land which has been long under trees, should be rested by a crop of vegetables with dung. We have already mentioned some of the crops which may advantageously be used as preparing crops before sowing some sorts of tree seeds. If, however, the crop which is immediately to follow be transplanted trees or thorns, potatoes may precede with great propriety. Beans, with manure, will also be found an excellent preparative. Carrots, manured with a good dressing of dung, may also be admitted; but they are a very scourging crop. We cannot enter upon the methods of preparing the land

for, and sowing the seeds of culinary vegetables here*.

DESTROYING WEEDS.

The dry weather of this month is a proper time to begin the killing of the rising weeds. A man will do more execution in a day now than he would do in a week, if the weeds were allowed to get to a large size before he began. Besides, by an early clearance of the weeds, the powers of the soil are reserved for the growth of the young trees. It is a very disgraceful thing for a nurseryman to have his ground in a weedy state.

* We beg leave to refer to "The Gardener's Kalendar, or Monthly Directory of Operations in every branch of Horticulture," one volume octavo, published by Messrs Constable and Company.

ORNAMENTAL PLANTATIONS.

It is presumed that, by this time, the grounds intended for Ornamental Plantations will be in a state to receive all kinds of deciduous trees. The fir must still be withheld, excepting in such grounds as are very high and dry in their nature. Such as are so, should be furnished with their evergreen firs about the end of this month ; but the general planting of firs must be delayed till next month.

The works which were recommended for last month under this article, may be continued in this: It would be needless here to repeat the directions formerly given.

In all cases where it is intended to crop with vegetables, the land which has been planted after trenching, summer-fallow, or digging, may now be prepared for their reception. None of such crops should be introduced, unless the land be previously dunged. If cabbages or potatoes be planted, only one plant in the centre of every four trees, should be put in. This thin planting will produce a greater crop than if they were thicker planted, and be less injurious to the trees:

Sowing Lettuces among young plantations, will be found a very profitable crop for feeding swine. Besides, Lettuces, though a great crop, have this advantage, that they exhaust the land very little, if any thing at all. There is no crop that will enrich the land more than Lettuces when digged down after having grown to a large size. We have tried this, and found the good effects for several years after. Carrots, as already observed, is one of the heaviest crops that can be put among young plantations, and should seldom or never be sown among them. Parsnips are much less hurtful.

A rotation of crops among young trees will be found of great use. Supposing a crop of Potatoes the first year with dung: Cabbages may follow without dung; and afterwards Lettuces without dung. In the fourth spring the ground should be sown down with grass seeds.

But whatever sort of crop be planted or sown among young trees, care must be taken not to put it so near the trees as to disturb their roots, either in planting, in working, or in taking up. Above, we have recommended dung as a necessary preparation for any of the more scourging crops. Yet we have found that plantations, made in land of tolerable quality, which had been under rotation of corn crops for agricultural purposes, and not run out at the time of planting, throve much better, even when cropped with potatoes

and greens without dung, but properly hoed, than those that were left to nature without any crops being put among them. Keeping a plantation clear of weeds, and renewing the surface of the ground among the trees by frequent hoeing, is the surest way to procure a rapid growth among the plants; and we would only allow of introducing vegetable crops to secure the better cleaning and hoeing of the surface of the earth; because if the trees succeed better even with the oppression of green crops, when properly hoed, than those left in a state of nature, what must they do, when properly hoed and attended to without the oppression of another crop?

If the trees have thriven, as might be expected, no more crops after the third year can be introduced; in which case, by the end of this month, the plantations may be sown with White Clover and Perennial Rye-grass seeds. This mode of management will procure crops of useful grass, a more pleasing and agreeable surface, and better growth of trees, than if the plantation were allowed to take its chance in the ordinary way; and it is what should be universally practised among every plantation which can bear the name of Ornamental.

Pruning ought to be suspended till the vigour of the growth is over, for reasons previously stated.

Thinning is still to be carried on—especially of the Birch, Mountain-Ash, Huntingdon and Bedford Willow, Black Poplar, and Spanish Chesnut. The thinning of Oaks is to be suspended till *May*; which see.

FOREST PLANTATIONS.

Most probably by the end of this month, the whole grounds in any plantation will require to be planted. But if in any place the land is over damp, it is better to put off the planting until the pits, or otherwise prepared land, be sufficiently dry for the reception of the plants. It is very hurtful to plants to be put into standing water: Even the aquatic plants themselves, such as the Alder, Birch, Willow, or the Poplar, when put into pits with water in them, have their roots seriously injured, or what nurseryman call *scalded*, by standing only for a week or two in such a state. Low grounds or soils of a retentive nature, may not, therefore, be in a fit state for planting for some time to come. Firs must not yet be planted, excepting, as formerly observed, on elevated dry spots, which are liable to be hurt by the severe droughts of May and June. In the early part of April, or indeed, in some cases in May, firs will succeed better than if planted now.

BEETING UP PLANTATIONS.

It is now the proper season for this work. *Beeting*, is subject to several restrictions. A forest plantation after pitting, either in the mass form or ordinary mixture, should remain several years after planting, before any *beeting* of the apparently dead *hard-wood* plants takes place. Hard-wood plants, in the first year, and even sometimes in the second year after planting, die down quite to the surface of the ground, and are apparently dead, while their roots, and the wood immediately above them, are quite fresh, and capable of producing very vigorous shoots, which they frequently do produce, if allowed to stand in their places. If a tree, such as that above alluded to, be taken out the first or the second year after planting, and the place filled up with a fresh plant of the same kind, what happened to the former may probably happen to the latter ; and so the period of raising a plant on the spot may be protracted to a great length of time ; or it is possible this object may never be gained.

The beeting of the *hard-wood* kinds in a plantation which has been planted after trenching, or summer fallow which has been kept clean by the hoe, may be done with safety at an earlier period than under the foregoing circumstances ; because the trees, in the present case, have greater en-

couragement to grow vigorously after planting, and may be more easily ascertained to be entirely dead, than where the natural herbage is allowed to grow among them.

While the beeting up of the *hard-wood* is properly protracted for several years after planting, that of the larches and firs may take place the first spring after the plantation has been made ; because, such as have died are more easily distinguished. In many cases when a larch or a fir loses its top, either by dying down, or the biting of hares or rabbits, the most vigorous lateral branch is elected by nature to supply the deficiency, which by degrees assumes the character of an original top. Firs and Larches, therefore, which have fresh lateral branches, are not to be displaced, although they have lost their tops. Indeed, no tree in the forest, or other plantation, ought to be removed, until there be no room left to hope for its recovery.

While we offer the above reflections to guard against precipitate beeting, we are equally desirous that it should not be left undone for too long a time.

If the beeting of plantations be left undone till the trees have risen to fifteen or twenty feet in height, their roots are spread far abroad and their tops occupy a considerable space. The introduction of two or three plants, from a foot to three feet in height, at a particular deficient place, can

never, in the above circumstances, be attended with any advantage. Such plants may indeed become bushes, and may answer well enough in the character of underwood, but they will for ever remain unfit for any other purpose.

It is highly improper, then, to commence the beeting of hard-wood plantations before the third year after planting; or to protract it beyond the fifth or the sixth.

We have mentioned above, the impropriety of planting young plants among large trees; nevertheless, we would not be understood as dissuading from planting a vacant space of several falls in extent, even in grown woods. Where such spaces happen to occur, they may and ought to be planted up, even when surrounded with trees of fifteen or twenty feet in height.

When trees in an old plantation have been felled, so as to leave vacancies of a half or a whole acre, such may be replanted with great propriety. It may, however, be observed, that there ought to be as great a difference between the natures of the former and intended occupiers, as the soil will possibly admit. If, for instance, the trees removed were Scots Fir; perhaps, Oaks, Elms, or Ash may follow; along with nurses of Willow, Elder or Mountain-Ash, or a mixture of these.

It is impossible to note down here all the circumstances which may influence works of the above description. The intelligent planter must exercise caution and reflection. Precipitancy we

have found to be the greatest error a planter can fall into.

HEADING DOWN TREES.

It is now a proper time to examine all plantations which have been three or four years planted, to see if the *hard-wood* trees are in a thriving state; and such as have not begun to grow freely should be headed down to within three or four inches of the ground*. The cut must be made

* The celebrated M. de Buffon, of the Royal Academy of Paris, in his Memorial on the Culture of Woods to the French Government, in 1742, says, "The young tree left to itself in a strong and close soil, cannot extend its roots; the earth being too hard, makes them press upon one another; the small, tender, and herby fibres, which should nourish the tree, and form the new production of the year, cannot penetrate through the too firm substance of the earth; so the tree languishes, being deprived of nutriment, and the annual production often diminishes even so far as to put forth nothing but leaves and some buttons. If you cut this tree, all the strength of the sap is carried to the roots; it opens all their young shoots, and, acting with more violence against the ground which resists them, the young roots open to themselves new passages, and by the increase of their strength, divide the same earth which they had attacked in vain before; they find nourishing juices in it in abundance, and how soon they are settled in this new country, they shoot out with vigour the superabundance of their nutriment, and produce, the very first year, a shoot more vigorous and higher than the old trunk was after three years. I have repeated this experiment so often, that I can give it as a certain fact, and the most useful practice that I know in the culture of woods."

with the pruning knife in a sloping direction, with one effort. Great care should be taken not to bend over the tree in the act of cutting. By so bending, the root may be split ; a thing which too often happens.

The operation of cutting over young trees should not be performed at an earlier period of the season, because the wounded part might receive much injury from the severe weather in January and February, and the expected shoot be thereby prevented from rising so strong and vigorous.

THINNING FOREST PLANTATIONS.

We have shown, in last month, the impropriety of continuing the pruning of trees in this month, and in the months of April, May, or June. Thinning, however, as stated last month, may now be carried on, especially in cases where Birch, Mountain-Ash, Willow, and Spanish Chesnut, are the trees to be removed, and which are to be barked. The thinning out of the Oak is to be suspended till *May* ; which see.

WOODS AND COPSES.

IN the preceding month, directions were given for planting mixed Copses. Whatever more of such work remains to be done, ought not to be delayed, unless on account of the too damp state of the land. The drought of this month is generally very intense: Intervals of a few days may therefore be expected, when the damp of the wettest of the pits will be entirely dried up. These favourable times should be embraced with avidity, for the purposes of planting.

In last month we noticed, that the operation of cutting Coppice-wood of Birch, &c. should go on. If there is still any work of this kind to perform, it should now be done.

SOWING COPSES AND WOODS.

In the event of sowing copses, either of Oak, or of a mixture of kinds, in grass land which has been prepared only by pitting, like ordinary plantation, it would be proper to defer the work till next month. One special reason for deferring the sowing of acorns in the field till April, is, that they may be the more perfectly secured from the rava-

ges of field-mice. If the sowing of oats and other grains be going on in the adjoining fields, these vermin will be drawn that way, and will continue to live upon the grain as long as possible; but, were the acorns first put into the ground, a vast quantity of them might be destroyed.

Lands which have been prepared by fallow, have not so much harbourage for these vermin. Such, therefore, may be sown at this time. It is generally proper, previous to sowing, to give the land a dressing of small dung; to plough it neatly in, and harrow all flat.

No seeds that require two years for vegetating, should be sown in mixed copses, or, indeed, in any species of plantation. It is much better to sow them from the rot-heap in the nursery, early in the spring in which they are to *brier*; because, so treated, they will make far better shoots than if the seeds were allowed to lie in the ground dormant for a season. Besides, the care of keeping them clear of weeds, and protecting them from vermin, will be diminished a whole season; and the future cropping with vegetables may be done with more ease.

The directions which have been given, under the title *Nursery*, for sowing seeds, will give a correct idea, both of the deepness and thickness at which patches of Cope-wood seeds are to be sown. These patches should be at six feet distance from each other. They should be so disposed, as that

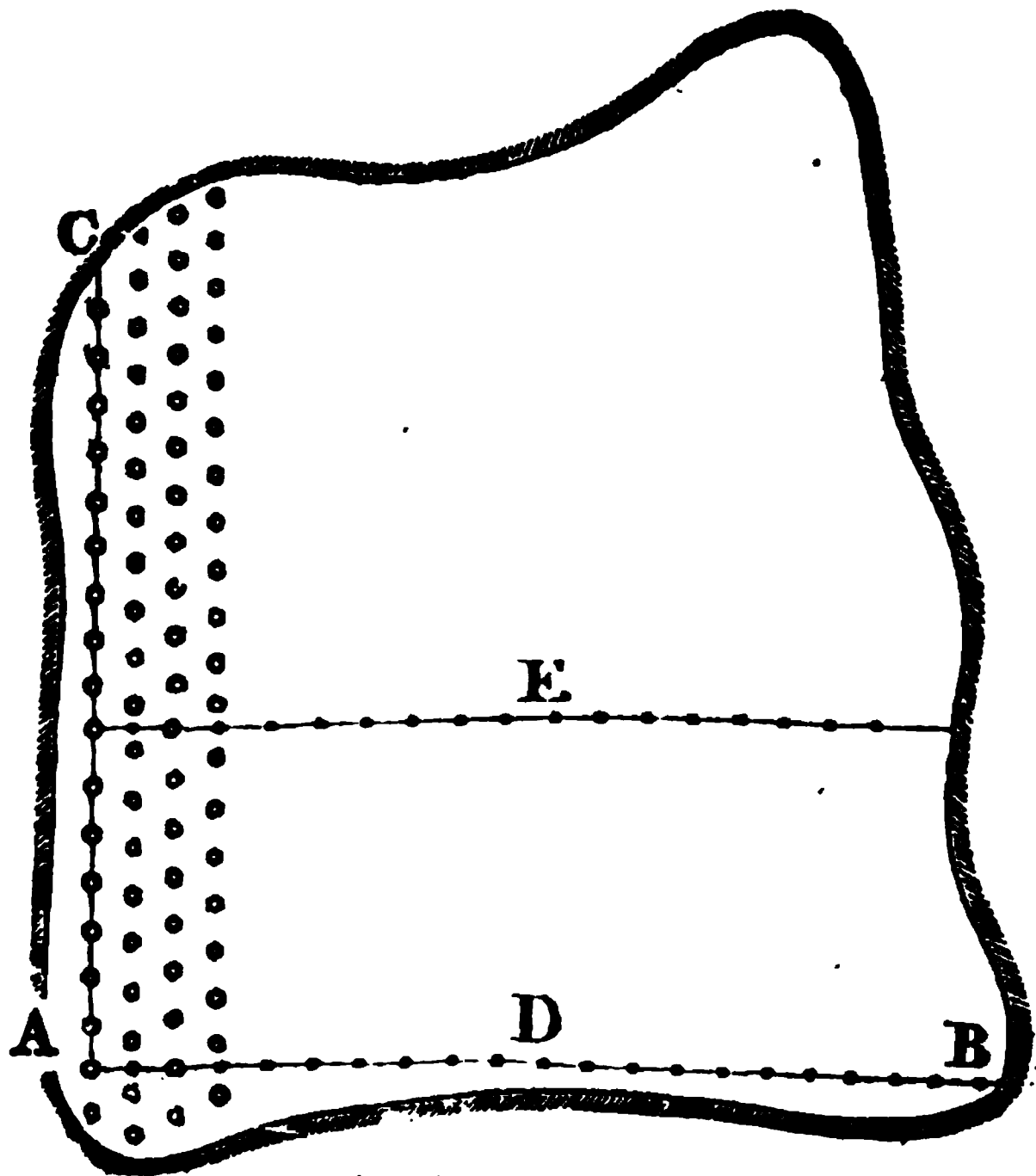
the patch in the one row shall be opposite the middle of the vacant space between the two patches of the opposite row, or in what is called the *Quincunx Order*.

The easiest manner of performing this, is by a chain marked at the proper distances. Look out for the permanent angle of the field which is nearest the square, that is, which will best correspond with an angle of 90° ; which being formed, let the limbs of this angle extend themselves the whole extent of your field either way, which can be easily done by poles, a hand line, and a hoe. Form a line parallel to the longest limb of the angle, and at ten, fifteen, or twenty times the distance proposed for the rows of plants. Begin at the other, or shortest limb of the angle, and measure on each of the above lines the distance of the proposed line of patches; which mark, by sticking up a small pin eight or nine inches long. These two lines may be so marked through their whole length. Then stretch the chain over the first two equidistant pins, and produce the line till the proper point be exactly marked upon the above-mentioned longest limb of the angle. While doing this, you go along the chain, and sow or plant the patches, as their nature requires. Of Chesnuts and Acorns there may be three good seeds in a patch, placed so as to form an equilateral triangle, whose sides shall be seven inches in length; and the smaller seeds may be scattered

over a space of the same size. Having finished this line of patches, stretch the chain over the next two pins, taking care that the exact half of a division be measured from the forementioned line or limb of the angle. Proceed to sow at the marks upon the chain in this manner; making the third line like the first, the fourth like the second, and so on to the end. And thus, the field will be sown in the best manner possible; the plants will each occupy their allotted circle; and the future operations of ploughing will be performed with far greater ease and perfection*.

In order that this subject may be the better understood, we shall here give a diagram, illustrative of the mode of sowing Woods and Copses now recommended in ground prepared by the plough.

* M. de Buffon's method of preparing the acorns for being sown in strong clay land, is by allowing them to *bourgeon*, or germinate in the earth. His words are: "I think I am able to affirm, that in order to sow a strong clay soil, the acorns should be kept in earth during winter, making a layer of two inches thick of acorns on a layer of earth of half a foot; then a bed of earth and a bed of acorns, alternately; and at length covering the whole with a foot thick of earth, that the frost may not penetrate into it. The acorns are to be taken out in the beginning of May, and planted. Those acorns which have *bourgeoned*, are already so many young oaks, and the success of a plantation made in this manner is not doubtful; even the expence is not considerable."



A, The permanent angle of the field nearest to an angle of 90° .

A B, *A C*, The limbs of the angle extended the whole length of the field.

D, The longest limb of the angle.

E, The line formed parallel to the longest limb of the angle.

. The pins denoting the distances between the rows of the patches.

o The patches.

**THINNING OUT THE PATCHES OF FORMER
SOWINGS.**

Woods and Copses, of whatever kind, should be carefully examined at this time. Those that were sown a season ago with small seeds, such as Birch or the like, and which rose very thick, should be thinned out, as directed for two-year seedlings in the nursery. And such as have been two years sown, and thinned out in the spring of last year, may now be thinned out to stand at the distances formerly recommended for planting Acorns and Chesnuts. We may again observe, that upon no account whatever are these patches to be eased with a spade, on pretence of making the work of thinning more practicable. The superfluous plants must be pulled out by main force, being careful to leave the best formed and most promising plants, and to disturb those left as little as possible. At the fourth season after sowing, the plants should be finally thinned out to single trees; observing to leave the finest plants, *i. e.* such as are best formed, and most promising in their appearance.

PREPARING THE GROUND AMONG LAST AND FORMER YEAR'S SOWN COPSES, FOR GREEN CROPS.

The last year's sown Copses which were cropped with potatoes, may now receive a furrow to

prepare the land for the reception of Lettuce seeds, or for such plants as are intended for the crop. The ploughing should not come quite close to the patches, for fear of disturbing their roots, or exposing them to injury by the drought of the ensuing summer.

The land may be prepared among young woods of the above description by the plough, till the plants rise to the height of eighteen inches, when ploughing should be discontinued. Afterwards, the land must be prepared by the spade ; or, perhaps, it may be better to sow it down with grass seeds, as recommended above, for young forest plantations ; which see. Indeed, digging among young Copse woods after this time will be of little advantage to them, as they are now well established ; and crops of clover and grass will be less hurtful than if the grounds were left to chance for a crop, and they will be much more useful.

FENCES.

THORN AND AQUATIC HEDGES.

INTENDED Thorn Hedges should forthwith be planted. Beech and Hornbeam for nursery or other shelterers, should also be completed.

All aquatic hedges and screens should be speedily finished. By this time cuttings will be apt to part with the bark in planting; care must therefore be taken, in the operation of planting, not to push it off. Indeed, especially after the season is so far advanced, it is better to use the dibble for cuttings, as advised under this article for last month.

BUILDING OF STONE FENCES WITH MORTAR.

Such works may now be carried on with great propriety, because it is to be expected that severe frosts are over for the season. Much more, however, is necessary in making a good wall, than the building of it after the frost is gone. We have known many tradesmen, who, from their slovenly

disposition, have spoiled good materials, even in the midst of summer weather. The building of walls is generally engaged for at so much a rood ; and it not unfrequently happens, that those who have the management or overseeing of the work, cannot detect the imperfection of the execution till it be too late. It is for the sake of such persons that we offer the following observations.

In order to make durable walls, it is not only necessary to use lime, but to use it under proper circumstances, and with such a proportion of sand as is fit to make proper mortar or cement. *Properly prepared mortar* in a wall is its bond of union, and the pledge of its durability. A wall built with ill prepared mortar is not so efficient as a good dry-stone dike.

The most profitable lime for building, is such as requires the greatest quantity of sand to a given quantity of *lime-shells* *, to make proper mortar.

Different limes, although of equal strength, may require very different treatment in preparing them for building. We have known a lime which would have fallen to fine powder, on the application of water, although it had been several months removed from the burning kiln ; while others removed but a week or two, would never after fall into powdery lime. If, however, the latter sort had

* Quicklime in pieces, as it comes from the kiln.

been removed from the kiln while hot, and covered with sand before the application of water, it would most readily have fallen into as fine powder as could have been desired. But no lime-shells ever fall so speedily as immediately after they are removed from the burning kiln.

In order to prepare proper mortar for building, it is necessary to riddle the lime. This operation is best performed, as soon as the lime is cold after watering. The cooling is greatly facilitated by turning. The time spent in the operation of riddling, will be more than repaid by the greater progress in building. Besides, the mason will not be obliged to toss away the best particles of the lime with the cinders, chips of stones and the like, which are to be found even among the cleanest lime that has not been riddled.

The sand should also be riddled if necessary.

A barley-firLOT of good lime-shells will require 300 pounds of good sharp sand.

The sand should be added to the lime when in a powdery state. They should be intimately mixed together, and afterwards thoroughly drenched with water, and so left in what is called a *sour-ing heap* for at least eight days before it is made into mortar for building ; but twice that length of time would be still better. When it is to be used, it is not sufficient to add a quantity of water to make it thin ; it must also have a hearty application of the back of the spade or shovel, by smart

strokes, to break down the lime, and unite it and the sand as completely as possible.

The sand most proper to be used, is such as is quite free from earthy particles. Sea sand, of good *grist*, takes strong band, and is very proper for walls and division fences. Pit sand, however, will be found better for house-walls; because it does not attract the damp so readily as the other.

We judge it unnecessary in this place, to speak of any other kind of mortar than that composed of lime and sand, which is the best.

Good stones are an essential part of a good wall. Such should be used as are clean, *i. e.* not coated over with an earthy or clayey substance. We have known stones, of good quality in other respects, so foul, that walls built with them never took band. Where there are none but foul stones to be had, the best method of preparing them, is by exposing them in a thin, loose manner, to the winter rains. The frosts may destroy some of the softer of them; but better have half the quantity properly prepared, than the whole unfit.

When the object is merely to procure a fence, it is a matter of small moment what sort or variety of stones be used, provided they be durable. But where the wall is to be used also as a fruit-wall, we would prefer one of dark *whinstone**, of close texture, built with black mortar, even to

* Greenstone and Basalt.

a brick wall. The mortar can easily be made black, by mixing soot in working it, or when the lime is in a powdery state.

Circumstances and taste must regulate the height of the wall. A six-foot wall will, however, be found a complete fence. The thickness of a six-foot wall, at the foundation, ought to be twenty-four inches, and at the top eighteen. The same thickness at foundation and top, will answer for a wall twelve or fifteen feet in height; but, when the wall is below six feet in height, the thickness may be reduced in proportion.

In the building of the wall, care must be taken that the stones be laid upon their beds, and so as to *break band* in the most perfect manner that the materials will allow. The plan of setting stones on edge; of building up, as it were, two skins, and filling in loose stones, with a dash of a trowelful of mortar on their top, cannot be too much execrated or guarded against; and nothing is more common, when walls are built by the rood. The stones of the wall should, as often as possible, pass from side to side, and, at all events, should have a hold from the opposite side to within four or five inches of the surface or face of the wall; and the heart of the wall should be intimately and closely packed.

The coping of a wall is an article of considerable importance. It should be so disposed as to turn the water off the wall. Two stones placed

on their edges, so as to have their under and outer surfaces flush with the sides of the wall, and to meet in a sharp point at top, form a good coping ; but any other manner which taste may suggest will answer equally well, provided the water be turned off to the outsides of the wall, which is all that is the essential part of good coping.

The scoriæ, slags or *danders*, to be found at glassworks, saltworks, and iron founderies, make excellent coping, provided they be built with good mortar ; indeed, less will be required to build them with, than to dash them after they are laid together in the common way ; and the difference in durability is very great.

BUILDING TOP-DIKES WITH TURF, AND MORTAR OF CLAY.

In some cases, the turfs for building top-dikes with mortar of clay, as described in *January* under this article, may now be prepared ; in which case, the dikes should now be set about. Building them at an earlier period might subject them to destruction by frosts, to which they would be equally liable as walls built with mortar of lime.

If fine hard black peat can be readily procured, and be built with mortar of clay, it will stand for a great length of time.

The thickness and height of the above species of top-dikes may be the same as recommended for *top-dikes* in *January* ; which see.

BUILDING TURF WALLS.

In situations where stone walls cannot be had, or where they are not desired, and where hedges are not to be introduced, walls may be formed of turf at little expence and of considerable durability. For this purpose, the turfs should be tough and firm, such as are to be had in old grass land. It is only in situations where the materials can be procured, without expence of carriage, that such walls should be attempted.

The turfs should be cut nine inches square, and in no greater quantities than can be built up on the same day. Having provided turfs, stretch a line for a convenient length where the wall is to stand. Along by it, place a row of the turfs, green side out, and the same on the opposite side. Fill up the vacant space between them with *puddle**, pressing it so as not to displace any of the turfs. Allow this to dry a little, and then lay on other two rows of turfs, adding puddle as before, and so on till it be at the desired height. Finish the whole at top by a turf, green side out, and so large

* Puddle is prepared for such purposes from rich soft earth, which is free of stones. It is wrought like mortar for building ; and should lie some weeks in a large heap, after being wrought, before it be used.

as to reach from side to side of the wall, and so as to be a little rounded in the middle.

A frame, the size of the proposed wall, is necessary to build by. Two feet and a half at bottom, and two feet at top, will be a proper thickness for a four-feet wall. If it is to be higher, the thickness must increase in proportion. But walls of these materials must not be attempted to be made very high. If, however, moderate-sized walls, of four or five feet high be properly built as above, they will stand for a great number of years.

MAKING DITCH FENCES, AND SOWING WHIN SEEDS ON THEIR TOPS.

In situations where none of the foregoing kinds of Fences can be easily procured, or where they are not desired, fences of considerable effect can be formed by a ditch, with a hedge of Whins on the top.

The ditch for this purpose should never be less than a six-feet ditch, and is to be formed after the manner recommended for ditching for Thorn Hedges in *January*; which see. This is now a fit time for sowing the whin seeds, which is done in a drill, made with the corner of a hoe, along the top of the ridge of earth thrown from the ditch, as if for sowing spinage, or about an inch deep. The seeds are to be dropped in at half an inch apart,

and covered, by drawing on the earth by the foot, or a garden rake.

In dividing lands of little value, two five feet ditches, at such a distance from each other as will allow the earth thrown out in forming them to make a pretty steep ridge, and whin seeds sown on the top as above directed, will be found a cheap and often an effectual fence, while the ditches will prove good drains.

APRIL

April.

THE NURSERY.

IT is presumed that all sorts of deciduous seedlings have, by this time, been planted out. If not, there is not a moment to be lost. Indeed, it is very improper that any of the kinds, excepting, perhaps, the Ash, should be so long in being planted out in the Nursery. The methods of Laying and Planting have already been treated of in *February* ; which see.

**LIFTING AND PLANTING OUT EVERGREENS AND
FIRS IN THE NURSERY.**

By the middle of this month, it will be proper to lift and lay, or plant out, seedling Evergreen trees ; as Firs, Hollies, Yews, Privets, and the like. Evergreen seedlings must be very differently treated from the deciduous kinds. We recommended the lifting and shouthing the latter ; but no more

of the evergreens must be lifted at once from the seed-bed, than can be planted out in the same day ; excepting in the case of bringing them from a distant nursery, from which, as soon as they arrive, they should be shoughed thin, as advised for the deciduous seedlings in *February*. In lifting evergreen seedlings, they should be as little shaken as possible, in order to retain a good portion of the mould in which they grew, adhering to their roots. Indeed, the more they carry with them to their new situation, the better is their future progress secured.

LAYING OUT SCOTS FIRS.

Those that are fit for laying out, are such as have stood for two years in the seed-bed ; if Scots Firs are allowed to stand a third year in the seed-bed, they are good for nothing. In lifting two year seedlings, they should be carefully eased, as directed for two-year seedlings in *February* ; to which we beg leave to refer the reader, (p. 226.)

The distances at which they should be laid, or planted, is twelve inches between the lines, and three inches apart in the lines. Scots Firs should never stand longer in the lines than one year after planting, unless they are to be planted out in very fine ground, in which case they may be allowed two years in the lines : in this case, however, they should not stand nearer to one another in the lines

than six inches, and the above distance between the lines. Two-year seedling Scots Firs, of good growth, one year planted out in good ground, rise with far better roots in proportion to their tops, than when of any other age, and are therefore more fit for general use.

The Scots Fir seedlings should never be laid or planted out in poor land ; nor, if possible, in that which is stiff or hard in its nature. Soft mellow ground which has been under a crop of potatoes with dung the preceding season, will answer best. If, however, it is not rich, it should at this time receive a dressing of small dung ; which will encourage the roots of the young plants very much.

Laying out Spruce Firs.

Spruce Firs, which have stood two years in the seedbed, being of good growths, may now be laid out. If, however, the spruces appear weak at two years, and stand thin in the beds, they may be allowed another year ; by which time they *must* be lifted, and planted out. They ought, like the Scots firs, to be eased by the spade, and lifted with great care, shaking the earth from the roots as little as possible. Land of the same quality, and prepared in the same way as above directed for the Scots fir, is required for the Spruce :—It may here be observed, that the spruces are very

fond of a humid rich earth ;—in such they will make very rapid progress.

If the spruces are intended for one year nursing, to prepare them for being slitted into the forest, they should be laid nine inches between the lines, and four or five inches apart in the lines: But if they are to stand two years in the lines, they should be twelve inches distant between the lines, and six inches in the lines. If they are to remain longer in the Nursery, they must be replanted after having stood in the lines for two years.

Silver Fir.

Silver Firs should be allowed two years in the seed-bed before being transplanted into lines. If they have risen good plants, they should not be allowed a third year in the beds ;—indeed, they should scarcely ever stand three years. The Silver Fir naturally spreads its infant branches abroad upon the surface of the ground, and therefore requires a greater space than the Spruces ; but, in respect to quality of soil, richness and the like, both require the same. If two-year Silver Firs are to be nursed only one year, they may be put in at nine inches between the lines, and six inches between the plants in the lines: But if they are to be nursed for two years, they should be fifteen

inches apart between the lines, and eight inches in the lines.

Balm of Gilead Fir.

Balm of Gilead Firs should be treated, in all respects, as above advised for the Spruce Firs.

Weymouth Pine.

Weymouth Pines should never be allowed more than two years in the seed-bed ; and they should not to be transplanted sooner. They require a very well pulverized and rich soil for being transplanted in ; and if it can be had of a sub-humid nature, they will thrive the better. The Weymouth Pine should be nursed two years before being planted out into the forest. Twelve inches between the lines, and eight inches apart in the lines, will be found the best distances at which to plant them in the Nursery.

Pinasters. .

Pinasters generally rise to well-sized plants the first year after sowing, and should then be planted out in line. If Pinasters be allowed two years in the seed-bed, they become so tall and slender, and withal have so poor roots, that they are very much the worse for it. Pinasters may be.

planted out into the forest after one year's nursing in the lines ; and they should never stand longer in the lines than two years. If they are to be lifted after one year's nursing, they should be planted at nine inches between the lines, and four inches apart in the lines : But, if to be nursed two years, fifteen inches between the lines, and eight inches between the plants, is little enough. The land most suitable for these is a rich, well parted soil, rather sandy and dry.

The Stone Pine.

This, like the Pinaster, requires to be lifted from the seed-bed at one year old ;—indeed, in all respects, both as to soil and management, it should be treated like the Pinaster. It is necessary, however, to be especially careful in lifting the Stone Pine ; because it sends down very long roots, and if these be much broken in lifting, the plants will certainly fail.

White American Spruce Fir.

This must always remain for two years in the seed-bed, and will seldom require a longer time in it ;—indeed never, if it has risen, as it generally does, to a good size the first year. They should be planted, to be nursed two years : twelve inches between the lines, and six inches apart in the lines, will answer well. The soil most pro-

per for them is a rich sandy earth, and pretty dry.

Black and Red American Spruce.

These are much more delicate than the White. It will, however, be seldom prudent to allow them more than two years in the seed-bed; and they should never have less. After these have stood two years in the seed-bed, they should be planted out in beds, at six inches apart, to stand for one year;—at the end of which they will again require to be lifted, and treated as above advised for the White American Spruce. The soil that is most proper for this sort is a damp sandy or submossy soil, and the situation of the beds, for their first transplantation, should be such as not to expose them to the mid-day sun.

The Cedar of Lebanon

Is raised in boxes of light earth, or on a well prepared and sheltered border. When one year old, it must be lifted and planted out in a piece of the finest land, to stand for two years only. It never arrives at so great a height, if planted into the forest at a greater age. The distance for planting in the nursery lines, is the same as advised for the Silver Fir. It is a safe and good method, to plant

them single into pots from the seed boxes, by which means they can be planted with proper balls of earth at their roots.

Hollies.

Hollies which have stood two years in the seed-bed, must now be lifted and planted out in beds, at five or six inches apart, in which to stand for two years. The best situation is one shaded from the mid-day sun. The soil most proper for them is a rich sandy earth. Such Hollies as have stood for two years in beds, are now to be lifted and planted out in lines to stand for two years more. Choose a piece of the richest light land, and, if possible, a damp day, and let them be planted fifteen inches between the lines, and eight inches in the lines, which will be room sufficient.

Yews.

Yews, which have stood two years in the seed-bed, are to be, in all respects, treated as above directed for Hollies.

Such Yews as are raised from cuttings for hedges, or dwarf underwood, are now to be lifted and replanted. These should stand at fourteen or fifteen inches distance between the lines, and seven or eight inches apart in the lines ; or they

may be still wider, if they have risen to a good size.

SOWING SEEDS.

The reserved Beech-mast, and Elm-seeds, should now be put into the ground, as advised last month under this article ; which see.

Before giving directions for sowing Larch and Fir seeds, it will be right to describe the method of extracting the seeds from the cones.

Of Taking out Larch and Fir Seeds.

In the winter months, we have advised the gathering of Larch and Fir cones of various sorts, and of keeping them in a dry place, till now, being the time of sowing.

The way of taking them out is by means of fire-heat in a kiln. The cone-kiln is constructed after the manner of a common malt-kiln : The *kebers* or bearers should be about nine feet distant from the fire, and two inches apart. A hair-cloth is spread over them from side to side of the kiln, and the cones are laid on it to the thickness of twelve or fourteen inches. A gentle fire is then applied, and regularly kept up till the cones become opened. During the time of drying, the cones must be frequently turned upon the kiln ; and when the seeds begin to drop out, they must

be removed to a dry barn, and sifted till all the seeds which are loose fall out, and be taken from among the cones. The cones are afterwards to be thrashed severely with flails, and sifted as before, and so on till the seeds are taken out as completely as possible.

It is, however, a safer method to split the Larch cones before putting them into the kiln. This operation is performed by a small flat triangular spatula, sharpened at the point and cutting angles, and helved like a shoemaker's awl. The cone is held by the fore-finger and thumb of the one hand, upon a flat piece of wood, while, with the other, by the splitter, it is split up from the great end; and afterwards each half is split up the middle, which parts the cone into four divisions. This affords occupation in wet or stormy weather in the winter season, for the hands of a place, or for boys or girls, or old people; and is by far the best and least destructive to the seeds, of any method we know; because the cones so split, when exposed to the heat, are suddenly opened, and readily discharge the seeds; which, consequently, are less injured by the fire heat.

Beside the above method of splitting, there are others. Some people use a cone-mill, which has large sharp teeth in a concave cylinder, and others fixed in a corresponding roller. The mill is wrought by turning the roller by a handle resembling that of common fanners. The cones are let in-

to the mill by a hopper. This instrument is very difficult to work, and bruises the seeds very much; many of which are of course destroyed.

We have several times made use of the common improved Bark-mill, for separating the seeds from Larch fir cones; but the cones are thus so much compressed and bruised, that the seeds suffer exceedingly, and we would by no means advise it: Indeed, among all the methods which we have known adopted, to perform the painful and laborious work of extracting the seeds of the Larch, the plan of splitting them singly, as above said, is infinitely the best and safest for the seeds, and ought to be adopted by every one who has occasion to use only small quantities of seed. None of the other kinds of cones require so much labour as the Larch, excepting, perhaps, those of the Cedar of Lebanon, and Black American Spruce.

Cones, which have given out all their seeds, are generally, and very properly, used as fuel for drying other cones. This sort of fuel requires the attention of a very steady feeder. Indeed, the most careful and attentive are apt to set the full or drying cones on fire, from the resinous nature, and tendency to flame, of the empty cones used as fuel. Such kilns should, therefore, be erected in situations far removed from a dangerous neighbourhood.

The cones of Scots Fir, the Larch, and the Spruce, are the principal kinds which are opened

by kiln heat. The cones of the Silver Fir, the Balm of Gilead Fir, and the Weymouth Pine, give out their seeds with very little trouble;—indeed, if they be not gathered soon in autumn, and kept from severe drought, they will fall to pieces of their own accord. In Scotland, we have very few trees of the Stone Pine, the Pinaster or Cluster Pine, or the Weymouth Pine, that produce seeds: We are, therefore, supplied with seeds of these from England. Seeds of the White American Spruce are procured from England, and from warm situations in Scotland, and also from America, and are generally sold in a clean state, or separated from the cones. Cones of the Black and Red Spruce are brought from America*, and sold in the state of cones in England and Scotland. The cones should be split, and exposed in a sieve *tilted* before a gentle fire, with a sheet of paper below the sieve to receive the seeds as they fall out. The seeds should be removed every quarter of an hour; because they are small, and are very easily injured by the heat.

Cedar of Lebanon.

The cones should be kept for one year at least, after they are taken from the tree, before the seed

* Since writing the above, I have procured half a boll of Black American Spruce-Fir cones, well filled with good seeds, from a peculiar situation in Fifeshire in 1813; and in 1815, two bolls from the same trees.

be attempted to be taken out. This is necessary, on account of the soft nature of the seeds, and the great quantity of resinous matter which the cones contain when growing, and which is discharged by the keeping.

The best way to take out the seeds of the Cedar, is to split the cones, by driving a sharp conical piece of iron through the heart of them. This work, as well as the taking out of the seeds, is greatly facilitated, by steeping the cones in water for a day or two, previous to splitting them. The coats of the leaves should be opened with the hand, and the seeds carefully taken out. The cones of the cedar are brought from the Levant, and may be purchased with safety for seed, although it be several years since they were taken from the tree.

Sowing Cedar of Lebanon Seeds.

The seeds of the Cedar should be sown in boxes of light sandy loam ; or on a spot of properly prepared light soil, which is well sheltered. The covering should be half an inch thick.

Sowing Scots Fir Seeds.

The land fit for sowing Scots Fir seeds upon, is such as is free in its nature, and rich. It ought to be prepared by a previous crop of vegetables with dung ; such as peas, beans, lettuces, turnip, or the

like. We have already shown, that a crop of potatoes should never immediately precede a crop of seedlings. We have already directed, that land for fir seeds should be dugged or ridged up in the month of February, in order to pulverize it the more perfectly. It must now be flatted down, and receive from six to ten wheel-barrows of well prepared dung to each fall. It is then to be dugged and raked, as directed in *February* for sowing haws; only, the soil for the fir seed should be made still finer. Beds are the only form to be used, either for the firs or the larches. They should be sown so as to rise at the distance of a quarter of an inch from one another. The covering should be half an inch thick. The manner of performing the work has been treated of in *February*; which see, (p. 241.)

Sowing Larch Seeds.

Larch fir seeds should always follow a crop of two-year seedling Scots firs. No preparation of the land can equal that of the roots of seedling Scots firs. The ground on which larches should be put, is such as was cleared of the crop of Scots firs in September last, and which has been wrought several times during the winter. If land, which has been under Scots firs the preceding season, cannot be had, the next best preparation is a crop of two-year seedling larch preceding. The

land should be dunged in the same proportion as previously recommended for the Scots fir. The same fineness of soil and method of sowing as above recommended for the Scots fir will answer. The covering of the larch should be a quarter of an inch. Previous to drawing on the covering, the roller should be drawn over the bed to press the seeds firmly into the earth. The larch should rise about the same thickness as the Scots fir. The manure for larch seeds must not be new dung from the stable or cow-house; either of these proves highly pernicious to the young plants, and would be the cause of many of them dying. Old dung from a hotbed will answer well; only such must be laid on very thick, because it has been greatly exhausted in the work in which it has been employed during the preceding summer.

Sowing Spruce-Fir Seeds.

The Spruce-fir seeds require the same quality of ground, in the same heart, and, upon the whole, the same treatment as above recommended for the Scots firs.

Sowing Balm of Gilead Fir Seeds.

The same treatment and soil as recommended for the Larch, will answer the Balm of Gilead; only the covering should not be less than half an

inch, nor more than three quarters of an inch thick.

Sowing Silver Fir Seeds.

The land most proper for Silver firs, is such as is above recommended for the Larch. They must not be sown too near one another than three in an inch. The covering should be a full inch thick, and performed with great accuracy: For if any of the seeds be left too lightly covered, or if any of them be too deeply covered, they will alike be destroyed. Indeed, the same may be said of all the fir tribe; for although they are extremely hardy when grown up, they are all very tender in infancy.

Sowing Weymouth Pine Seed.

The Weymouth Pine will succeed well under the same circumstances of soil and management with the Scots fir. The covering must be three quarters of an inch thick.

Sowing the Seeds of the Pinaster.

What we have said above respecting the sowing of the Silver fir, will apply equally to this, not only in soil and thickness, but as to depth of covering.

Sowing the Seeds of Stone Pine.

The Stone pine should be committed to land of equal quality with that recommended for the Scots fir. The covering should be an inch and a quarter. This, and especially the preceding kind, should be sown in the spot where they are intended to grow to maturity. The other method of managing which we have mentioned, will produce trees, but trees far inferior, both in stateliness and vigour, to such as are produced from seeds sown in the spot where they are to remain. The same may be said of all the fir tribe, and indeed of most other kinds of trees, as we have stated in a former part of this work.

Sowing White American Spruce Fir Seeds.

The White American Spruce seeds are smaller than those of any of the preceding kinds, and therefore require a lighter cover than any of them. One-fifth of an inch is quite sufficient. They should be sown on a piece of fine dry sandy loam, and be covered with earth of rotten leaves of trees to the above thickness, by sifting it upon them.

Sowing the Seeds of Black and Red American Spruce Fir.

Both of these sorts of seeds, as has already been intimated, are very small and tender. They are still smaller than the seeds of the White American Spruce, and therefore require a covering still lighter than above mentioned for it. The Black and Red American Spruce should be sown on rich boggy earth, which has been made very fine; and should be covered as lightly as possible. Rich mossy earth, containing a good portion of white sand, answers best. This should be sifted on with a fine sieve. Neither of these American Spruces will allow the roller to pass over them previous to covering. The whole of them should be shaded from the mid-day sun in the time of *briering*, and for some time after, by means of hoops and matting, or spruce fir branches stuck in the opposite alleys, so as to form an arch over the beds.

PROTECTING NEW-SOWN SEEDS FROM VERMIN.

This article of nursery work now becomes of very great importance. The attention of the nurseryman must not be relaxed for a single day after the sowing, until the firs have *briered*, and thrown off the husks; and until the acorns, and such as are liable to be destroyed by mice, be

risen. Indeed, a person who really deserves the name of a nurseryman cannot possibly feel himself easy till the fore-mentioned events happen. It is the safest and surest way to begin the watching of the fir seed immediately after sowing ; because, if the birds are prevented from becoming generally acquainted with the contents of the spot, they are much more easily kept off, than when they have been allowed to taste the seeds. In *February*, we have mentioned the necessity of using traps for destroying mice.

LIFTING EVERGREEN TREES FOR THE FOREST.

The operation of raising Evergreens and Firs for planting, should be performed with very great care, so as to save every fibre of the roots. For the purpose of raising them, strong spades, ridged in the middle of the plate, should be used. The spade is to be put straight down fully to the depth of the roots, and in the middle of the space between the rows, keeping the face of the spade towards what was the back-side of the row at the time of laying the plants, and pressing down the handle so as to ease up the plants completely. When they are drawn up, care should be taken not to shake the adhering earth from their roots : indeed the larger the ball be with which they can be carried to the field, so much the better for the

plants. When, from the dry state of the weather, they rise naked in the roots, or if the land be so sandy that they cannot carry any earth with them to the field, they may be *puddled*. The best puddle for the roots of plants, is made of rich earth and water mixed together, so as that when the roots of the plants are immersed in the mixture, a portion of it may adhere to them in a proper manner; if too thick, or too thin, it does not answer. In damp or rainy weather, however, puddling is rendered unnecessary.

In raising evergreens, care should be had to lift no more on a morning than it is intended to plant on the same day; because if they are left exposed to the drought of an April day, they may sustain much injury.

PREPARING GROUND FOR VEGETABLE CROPS.

Continue the preparing of the quarters of the nursery which have been longest under nursery crops, and which can best be spared for vegetable crops, to rest and prepare them for future crops of nursery.

DESTROYING WEEDS.

This is now become a very important work. The first crop of weeds in the season, is always the most vigorous; they therefore should be got down

as soon as possible. Weeds in the nursery should only be allowed *to appear*, and they should be seen no more. Even where no weeds appear, it is of great use to hoe the ground. By every new hoeing, a new surface is exposed to the action of the atmosphere. This surface becomes saturated with certain fertilizing powers of the air, and so is enabled greatly to benefit the growth of the plants. Indeed, more depends upon renewing the surface among plants, than upon the manure given to the ground previous to sowing or planting. Whoever, therefore, is scarce of dung, or who wishes to make a little of it go a great way, will find himself best aided by frequently hoeing or renewing the surface among his crop.

One thing, however, respecting hoeing, requires to be noticed here ; and that is, never to use the *push-hoe*, or Dutch hoe, when the object is the *enriching of the soil* ; because it cannot be made to penetrate into the soil sufficiently deep ; and it also leaves the soil rather crusted below a very thin surface. In the operation of hoeing for enriching the soil among plants, the hoe should be put in pretty deep ; for which reason, the mouth should not be too broad. Hoes made in the shape of those which are sent out to the West Indies for the sugar plantations are the best *. Previous, however, to a hoeing of the above kind, the push-hoe may be used for killing the weeds.

* Represented in Plate III. fig. 3.

CROPPING AMONG ORNAMENTAL PLANTATIONS.

The ornamental plantations intended to be cropped with vegetables, should now receive their crops, unless the Yellow, the Swedish, or the Common field Turnip be in view. Care should always be taken not to overdo plantations by crops of vegetables. The trees, it must be remembered, form the principal crop ; the others are intended chiefly as motives to lead to a more effectual culture of the land, and to help to pay for keeping it clean. In cases where the trees are anxiously wished to rise rapidly, that object will be best promoted by digging and hoeing among them, without any kind of under-crop being either sown or planted.

FOREST PLANTATIONS.

IN the last month, it was supposed that some of the low-situated and retentive-bottomed land might not then be fit for planting. No such hindrance, it is presumed, will now remain. Let, therefore, such lands be now furnished with the deciduous kinds of trees without delay.

This is also the proper season for planting out firs and evergreens. Attention should be paid, that no greater number of plants be lifted from the nursery than can be conveniently planted on the same day. Damp weather is the best for removing and planting out all sorts of evergreens. When the weather is very dry, and the plants rise destitute of earth at their roots, they should be *puddled*, as recommended under the article *Nursery* for this month ; which see. In all cases, care should be taken not to shake off any adhering earth from plants at the time of planting.

SOWING ACORNS.

In forest plantations, where it is intended to rear oaks from seeds, and where the nurses are in a proper stage of growth for their introduction, this is now a proper season for sowing the acorns.

The nurses being already planted, the pits for the reception of the acorns will be in waiting. The pits should be stirred or dug over immediately before the acorns are inserted. Three acorns are sufficient in a pit of fourteen inches diameter. They should be so placed as to form an equilateral triangle, whose angles are four inches within the edges of the pit, and two inches deep. The distance of the pits has already been determined at the pitting season, *May*.

SOWING OF FORESTS OF FIRS OR LARCHES.

Sowing the seeds of these kinds, or indeed of any kind, in the spot where they are to remain, is undoubtedly the surest means of producing them in the greatest perfection.

Nature has taught us, by the example of her forests, that trees sown in the lands where they are to grow to maturity, never fail to make the best timber, provided the soil and situation be congenial to them. But before she extend the boundaries of her woods to any considerable circuit, what countless numbers of seeds has she not thrown away? Depending upon accident, and a soil unmeliorated, her progress is necessarily unequal and slow.

Under the article *Nursery* for this month, we have shown that considerable preparation and care are necessary to procure a crop of Firs or Larches with certainty.

From a view of these circumstances, it will appear that the rearing of a forest of Firs or Larches, by sowing the seeds, although greatly to be desired, will be attended with considerable risk and care.

On a craggy brae, or on rocky or hilly ground, the pits should be dug, as directed for Forest Plantations in *May*, at three and a half, or four feet distance from one another; and the pits should be made at least twelve months before the sowing takes place, or perhaps two years, according to the nature of the soil. During the period between the first digging of the pits and the sowing of the seeds, they will require frequent stirrings and hoeings, in order to meliorate the soil more completely. In very rocky ground, where pitting would be difficult, if at all possible, the ground may be prepared by the mattock; paring off the sward by the broad end, and stirring the soil to a good depth by the small end, as advised for Forest Plantations in *January*.

If by this month, in the first year after pitting or otherwise preparing, the soil be found well parted and promising, the Fir and Larch seeds may be sown; and this should be done as nearly after the manner directed in the Nursery for the same kinds, as circumstances will allow. After sowing, a constant watching will be necessary, until the husk be thrown off the rising plants; as, until that time, many kind of birds seem to think

them a delightful food, and continue to pull them out of the ground. If the seeds are good, six or eight are sufficient for each pit.

If it be proposed to sow a Fir or Larch plantation after fallow, the ground should be well broken, and the seeds sown in patches at the distance of three or four feet, as directed for sowing Copses last month.

SOWING FORESTS IN GENERAL.

Although we have hitherto only mentioned the sowing of a few sorts of trees in the forest, we are decidedly of opinion (as elsewhere stated), that every kind of forest tree will succeed better by being reared from seeds in the place where it is to grow to maturity, than by being raised in any nursery whatever, and from thence transplanted into the forest. There are some kinds which, even under the present mode of management, should always be sown where they are to remain, namely, the Oak, the Spanish Chesnut, the Walnut, the Stone Pine, the Laburnum, and the Pinaster ; and to these may be added the Beech. The first roots of all these, as is well known, are peculiarly strong, and far extended. Nature seems to have expressed, by this intelligible language, the absolute propriety of their remaining in the identical spot where they have first taken root. Whenever, therefore, these sorts are intended to be raised, the ground should

be pitted and prepared for receiving the seeds; and it should be sheltered by proper nurses, as stated in the directions for sowing Acorns in the forest.

THINNING OUT SOWN FORESTS.

We have already mentioned the thinning out of the sown patches in woods and copses for last month; and as the directions there given, equally apply to the present species of thinning, the reader is referred to them.

KEEPING THE PITS OF SEEDLINGS CLEAR OF WEEDS.

The absolute necessity of this work must be abundantly evident. In cases where the ground had been previously occupied with *whins*, part of which had been cut away to facilitate the making of the pits, it will be especially needful to chop away the young growths around the sown pits, that the young and tender plants be not choked. The same care, to prevent the encroachment of all coarse herbage, is required. Wherever the pits produce weeds, these must be pulled out, and the plants kept as clear as if the pit were a part of the nursery, at least for the first year. The work of chopping the encroaching whins and coarse herbage, must be continued till the plants be well established, and have risen above them.

PLANTING SANDY MOORS, &c. WITH FIRS.

In a number of places throughout the country, there are large tracts of sandy moors covered with short heath and coarse grasses, of short growth, yielding at present hardly a few shillings per acre to the owners ; which, if they had been planted even with Scots firs, would have produced a very different return. We are aware, that planting extensive tracts of such sorts of ground, has been considered too expensive for gentlemen of ordinary fortunes to support. Experience, however, that infallible instructor, has taught us, that such could be planted at an easy price, and might be fenced for a small sum, by the turf-wall ditches, topped by whin hedges, as recommended under the article *Fences* for last month ; which see. Such fences will, with a very little help, prove a defence against the inroads of cattle, till the trees to be planted grow beyond the reach of harm.

Suppose it, then, to be fixed upon to plant such grounds with two-year seedling Scots firs, at the rate of five thousand on a Scots acre ; and supposing that these cost 2s. 6d. per thousand ; then will the plants for an acre cost 12s. 6d. Supposing that a man plant an acre, by the diamond-pointed dibble, in two days and a half, which he will perform with ease, and estimating his wages at 2s. 6d. per day ; then will an acre, including the cost of

the plants and expence of planting, quote the sum of 18s. 9d. The contingencies of carriage, &c. may be presumed to make this sum one pound Sterling. The burthen of planting an hundred or two hundred acres of such land, cannot be reckoned intolerable. But even supposing that a fourth part of the trees to be used were to be one-year seedling Larches, regularly disposed over the grounds, then would the expence of planting an acre amount only to the sum of 26s.; which, we presume, is a sum too inconsiderable to be an oppression to almost any landed proprietor. And when we take into account how much they will increase the value of the estates on which they are, the lucrative prospects which they hold forth to rising families, and the immense advantages which they secure, by making timber plenty in the country, it astonishes one that more is not done in that way. By no other means, which we know of, can young trees be so quickly planted in the forest, as by the diamond-pointed dibble. The plate of this instrument is made of good steel, and is four inches and a half broad where the iron handle is welded to it; each of the other two sides of the triangle is five inches long; the thickness of the plate is one-fifth part of an inch, made thinner from the middle to the sides, till the edges become sharp. The length of the iron handle is seven inches, and so strong as not to bend in working, which will require six-eighths of an inch square.

The iron handle is furnished with a turned hilt, like the handle of a large gimlet, both in its form and manner of being fixed on*.

The planter is furnished with a planting-bag, tied round his waist, in which he carries the plants. A stroke is given with the dibble, a little aslant, the point lying inwards; the handle of the dibble is then drawn towards the person, while its plate remains within the ground: By this means a vacuity is formed between the back of the dibble and the ground; into which the planter, with his other hand, introduces the roots of the seedling plant, being careful to put them fully to the bottom of the opening: He then pulls out the dibble, so as not to displace them, and gives the eased turf a smart stroke with the heel; and thus is the plant completely firmed. The greatest error the planter with this instrument can run into, is the imperfect introduction of the roots. *Green* or unpractised hands are apt to double the roots, or sometimes to lay them across the opening, instead of putting them straight down, as above directed. A careful man, however, will become, if not a speedy, at least a good planter in one day; and it is of more importance that he be a sure hand, than a quick one. A person who is of a careless or slovenly disposition, should never be allowed to handle a dibble of this kind.

* Plate III. fig. 1.

Besides the sandy moors covered with short heath now alluded to, there is also, particularly in Scotland, much ground covered with long heath; and this last is equally unproductive as the former. Such land, however, cannot generally be planted on so easy terms, even though the same kinds of plants are to be used; because part of the encumbering heath may require to be pared off to make room for the plants; and probably the ground may require plants which have been one year nursed. These larger plants cannot be so easily set as the seedlings above mentioned; and the plants themselves must cost a good deal more money; or, which is the same thing, must require a much longer time in the nursery, and much more labour to prepare them for such a purpose. Yet, with all these enhancing circumstances, the price of furnishing such trees, and planting an acre with them, cannot advance the sum *per* acre much above L. 4 Sterling, allowing 4000 trees to an acre.

Now, this will be found but a very small sum, when compared with the value of such a plantation after a certain period of years. For, supposing the expence of planting a Scots acre to be the sum of

And the fencing, by some of the easy methods recommended in this work,

to be	-	-	-	. 0 15 0
				<hr/>
				L. 4 15 0

The amount of this sum, improved for
30 years, at the rate of 5 *per cent.*
compound interest, will be

L. 20 12 9

And valuing the annual rent of an
acre of such land at 5s., and that
sum improved as above, it will amount to the sum of

16 12 5

Consequently the cost of an acre, by
the time that it is 30 years of age,
will be

37 5 2

But allowing the trees to have been
thinned out to nine feet apart by
their 30th year, then will a Scots
acre contain 670* trees; and al-
lowing these, at an easy valuation,
to be worth 5s. each, then will an
acre so filled be worth the sum
of

167 10 0

Which leaves a clear profit of no less
a sum than

L. 130 4 10

By the same rate of calculation, an
English acre will cost for trees and
planting

L. 2 15 0

Cost of fencing, as above

0 15 0

L. 8 10 0

* See Table in Appendix, No. IV. showing the number of trees which may be planted on a Scots and on an English acre, at certain distances.

This sum improved, at *5 per cent.*
 compound interest, for 80 years,
 will amount to - - L. 15 2 7
 Rent of an acre estimated at 4s.,
 which, for 80 years, at *5 per cent.*
 as above, will be - - 13 5 9

Aggregate expence by 80 years L. 28 8 4
 But if the trees be thinned out to nine
 feet apart, as above, then will an
 English acre contain 537, which,
 valued as above, will be equal to 184 5 0

Leaving a clear profit, at the above
 period, of no less a sum than L. 105 16 8

Calculations of the increasing value of such plantations might be carried on to many subsequent years; but we have said enough to establish fully the advantages of planting, under the circumstances alluded to. We have taken no account of the thinnings; these must doubtless have been worth a considerable sum from the 15th to the 80th year of the age of the plantation, and will fully cover the expence of pruning and thinning, together with like contingencies.

Even if ground of far greater annual value were planted, and with plants more expensive than the above, the profits could easily be shown to be an object of much importance.

We have known several instances of ground, of a quality to bear Oaks, Ash, Elm and Beech, and which had been planted with these as principals, and with Larches as nurses, where, at 30 years of age, the principals were estimated at 15s. each, one with another. But, supposing them worth only 10s. each, that is, the hardwood kinds above enumerated; and that by its 30th year, the plantation has been thinned out as above; then will a Scots acre be worth

	- - L. 335 0 0
--	------------------------------

And allowing the yearly rent of it to be L. 1, 10s.; this sum, in the form of an annuity for 30 years, at 5 *per cent.* compound interest, will quote L. 99 18 0

Suppose that the trees and planting cost

	- - L. 10 0 0
--	-----------------------------

And the fencing

	- 1 0 0
--	------------------

L. 11 0 0

This sum, improved at the rate of 5 *per cent.* compound interest for 30 years, will give

	- - 47 10 0
--	---------------------------

L. 147 3 0

Thus will a profit arise of no less a sum than

	- - - - 187 17 0
--	--

L. 385 0 0

It will appear from the above examples, that the better the quality of the land to be planted, the greater will be the advantages ultimately obtained. Nevertheless, we are far from advising the planting of such lands as may be fit for growing corn crops; there being abundance of other land, all over the country*, fit for the purposes of planting.

WOODS AND COPSES.

CONTINUE the sowing out of mixed Copses, and also finish the sowing of Oak Copses, as directed for last month. It has already been noticed, that the rows of patches sown last month should be distinguished by stakes, in order to prevent mistakes in the cropping of the spaces between. These, wherever intended, should now be cropped.

If potatoes be the crop intended, some of the early varieties which have short *shaws* are most proper; because tall or long growing stems are very injurious to the young trees. The lines of potatoes should not be nearer those of the trees

Z

* See Table of Waste Lands in Scotland, Appendix, No. III.

than twenty inches. We have formerly advised to plough down the dung before sowing copse woods. The potatoes must therefore be planted with the dibble, as in gardening. Three drills or rows will be sufficient for the six-feet space.

In cases where it is intended to crop such spaces with field turnip for feeding cattle, it will be proper to defer it for two months to come ; or at least till the first of June. We, however, would rather wish to see the garden yellow turnip grown in such situations ; because they are not so severe for the ground, neither are their tops so large, nor so apt to encroach upon the young trees ; and the weight of crop, even for feeding cattle, will not be very much less than the other. Swedish turnip for feeding horses are also a better crop for such places, than the common field turnips. The Swedish turnip should be sown in drills about the second week of May.

If carrots are determined on for the crop, they should be sown about the last week of this month.

Three drills of these, as advised for potatoes, will be found sufficiently heavy between the lines of trees.

The beginning of this month is a proper time to sow lettuce for feeding swine. The best method is in drills, nine inches apart, leaving a space of eighteen inches on either side ; and thus there will be six rows of lettuce between the lines of

trees; and the lettuce plants should be thinned out to six or eight inches in the row.

When there is a want of nursery ground, the spaces between the lines of patches may be employed in that way to nurse plants for a year, or for two years. These, however, will prove much more scourging for the crops than esculent vegetables. Trees, of any description whatever, are more nearly allied in nature to the tree seeds sown, than any kind of culinary vegetable is; and consequently, by requiring from the soil the same sort of food, must tend to exhaust the land more than any crop of such vegetables is likely to do: Besides, the succulent and spreading stems and leaves of these last are very useful in keeping the surface moist and soft. Planting of nursery articles, therefore, between the lines of patches, should only be resorted to in cases of necessity.

Some writers have advised to sow the spaces close up with crops of grain. Such a plan must receive our decided negative; because the seedling trees would thereby be overshadowed, if not destroyed. Neither, in this case, can the ground around the patches be wrought with the hoe: the want of which operation must tend very much to diminish their vigour. Indeed, unless the crop to be sown can keep its place securely, so as not to injure the plants by overhanging them, it should not be thought of. Long-pod, Windsor, or some

other of the stout-growing kinds of beans, are the only grain crops that we would ever wish to see sown among young copses ; and even they should never be sown nearer the rows of the coppice plants than twenty inches or two feet. If such grounds are to be cropped with beans, they should be planted at the above distances from the rows of trees ; and two rows will be quite sufficient for a space.

FENCES.

PLANTING EVERGREEN HEDGES.

It is now a fit season for making all Evergreen Hedges. Where disagreeable objects exist in any point or direction, they may, perhaps, be covered from the view by Evergreen Hedges, especially if situated at a considerable distance. Hedges should never, indeed, if it can possibly be avoided, be used near a residence ; because they give a confined and formal air to the grounds. In cases where disagreeable objects must be covered near the house, a neat shrubbery, or perhaps groups of trees, will answer better. When the end of a house, an old wall, or similar objects are required to be covered,

common ivy, Ayrshire rose, or evergreen thorn, may be used with good effect.

Planting Holly Hedges.

Hollies are the best for making durable fences and afford the greatest degree of shelter, especially during the winter months. No plant endures the shears better than the Holly. It may be carried to a great height, and consequently is highly fitted for situations where strength and shelter are required. It luxuriates most in rich sandy loams, although there are few soils in which it will not grow. After planting, the Holly makes but very indifferent progress for a few years; but after it becomes established in the ground; or, about the third or fourth year after planting, no fence whatever will outgrow the Holly.

The same method of planting recommended for the thorn, will answer for the Holly. It however may, in some cases, be necessary to plant hedges of it upon the surface without a ditch, as upon the back of a sunk fence, or the like. In such cases, it should be *laid*, as recommended for trees in the nursery. The best plants for such purposes, are those which have been nursed two years from the transplanted beds, or four-year old plants. Such should be planted at nine or ten inches apart. We have already spoken of the care necessary in preserving the adhering earth, at the roots of ever-

greens lifted from the nursery ground. Such care is especially important, in regard to the Holly. It is very hurtful to Holly plants to be lifted, and to have their roots exposed, in dry weather. It is therefore proper to delay lifting them, if possible, till damp weather: But if they must be lifted in time of drought, their roots should be *puddled*, as recommended under the article *Nursery*, for *February*; which see.

Planting Yew Hedges.

Yew Hedges ought also now to be planted. They are most properly adapted for division fences in the nursery or the garden, or for ornamental evergreen hedges. A yew hedge makes an excellent shelter; but is far too inoffensive for a division fence to protect a field, where even plants well armed with thorns often prove ineffectual. Yew bears the shears as well as any plant known; and, in the character of a hedge, it may be conducted to any height; but its growth is very slow. It will thrive in almost any soil.

The method recommended for planting the Holly on level ground, will also do for the Yew. Plants which are twelve or fifteen inches high, that have good roots, will answer well: Such should stand twelve or fourteen inches apart in the line of hedge. If dwarf hedges of Yew are required, such plants as are raised from cuttings

are to be preferred ; because they grow more dwarf than those which are raised from seeds.

Planting Evergreen-Privet Hedges.

Like the yew, the Privet is fit only for division-hedges in the nursery, or for dwarf ornamental hedges. Good plants, two years from cuttings, may be planted a foot apart in the line of hedge. The Privet will grow in almost any soil ; and it endures the shears with great patience. When planted in a hedge along with the white thorn in the proportion of one to two, it thrives well, and gives the hedge a lively appearance during winter.

Planting of Common Laurel Hedges.

The Laurel as a hedge, can only be used in the character of a screen or a shelterer : its lively green leaves make it very desirable for these purposes. It should not be planted too close ;—from eighteen inches to two feet is near enough. Neither the shears nor the switching bill are to be used upon the Laurel Hedge : It must be kept within bounds, by shortening the disorderly branches with the knife.

Planting Hedges of Tree-Box.

No plant makes more beautiful dwarf ornamental division hedges, than the Tree-Box, especially

the variegated varieties. Like the common Laurel, it should never be clipped or switched; but the straggling branches should be shortened in by the knife, so as to allow the small twigs and the leaves to express their own natural beauty. If the Box plants be a foot or eighteen inches high, they may be planted a foot apart in the line of hedge.

Spruce Fir Hedges.

Wherever sheltering hedges of evergreen trees are required, the Spruce will be found to answer well. The plants should, however, only be planted for a temporary shelter, or as a means of bringing forward a better; because they soon get bare at the bottom. For the above purpose, the Spruces should be planted eighteen inches apart.

BUILDING WALLS.

Every description of walls requiring to be built with mortar, either of lime or clay, should now be carried on with vigour. It is better for any wall to dry gradually, and even rather slowly, than otherwise. The walls which are built at this season will have this advantage.

CLEANING HEDGES.

The most of the winter-dressed hedges, together with those which were then planted, will now re-

quire to be cleaned. Even though the rising weeds make little appearance, it is better to destroy them early, than to allow them to get established, and then to cut them down, after they have robbed and overridden the hedge. After winter planting, any couch-grass, or other root weeds, will, by this time, be beginning to show their heads. If these are once allowed to become interwoven with the roots of the thorn plants, it is next to impossible to eradicate them; but if taken in time, and carefully kept down, they will be easily overcome. A little well-timed labour now, will prevent much after-trouble and vexation.

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MAY.

May.

THE NURSERY.

THE most pressing work in the Nursery, at this time, is to finish the planting out of any remaining evergreen seedlings, rooted layers, and the like.

SOWING FIR SEEDS.

In all cases where the sowing of Fir and Larch seeds has not been already completed, it should now be done ; and in no case should it be delayed beyond the first or second week of this month. It is of much importance to the nurseryman to sow all his Fir and Larch seeds, as well as all others which require protection from the birds, so as to rise about the same time ; because his labour will thus be greatly abridged.

WEEDING SEED-BEDS.

By this time the firs, and the seeds which were sown last month, will have a number of weeds

appearing among them. These are to be picked out with great care; and the more early that this work is performed, the less injury will the crop sustain, either in respect of the ground being impoverished, or the *briering* plants being picked up. Indeed, if the first weeding of the seed-beds be delayed till the weeds come to a considerable size, the crop will be much hurt, if not quite ruined. Even a thick rising crop of seedlings is often converted into a thin one, by delaying the weeding; while a thin crop is much improved by a timely and continued attention to weeding. A *nurseryman*, who can neglect his young trees in the above respect, or even walk through his grounds when his young plants languish under weeds, without the severest compunctions, exciting him to relieve them, is in no respect entitled to the name which he assumes.

RELIEVING INCRUSTED VEGETATING SEEDS.

It not unfrequently happens, that the land in which fir and larch seeds have been sown, becomes battered by heavy rains. This will certainly happen, if rain fall immediately after sowing, before the surface become dry; but if it once be fully dried after sowing, and before the rain fall, it will seldom or never batter. Suppose, however, the seed-beds are battered, so that the tender seeds cannot rise with freedom, the best way to relieve

them is to draw over them a wooden roller, stuck over with lath nails at half an inch distance, and driven in so as to remain half an inch beyond the wood of the roller. The roller should not be more than thirty inches long, and not more than thirty pounds weight*. By drawing this roller along the one side of the battered bed, while walking in the alley, and returning with it over the other, an ordinary sized bed will be completely relieved.

PLANTING OUT LARGE EVERGREENS IN THE NURSERY.

It is frequently necessary, and generally desirable, to have large Evergreen plants ready to remove to particular situations in the park and in

* Some people *rake* their battered beds, in order to enable the seeds to rise. This is a most dangerous and destructive method of relieving vegetating plants. From their tender state, the smallest twist breaks them over, and consequently destroys them. We have experienced much advantage from using the light, armed roller, here recommended. It is, however, much better when no such are required. The surest way to guard against the need of such means, is to work the land when it is in a proper condition, and to sow the seeds in such weather, as that the surface after sowing will be fully dry before rain come on. There is no dispensing with this precaution, when it is wished to secure an equal and good crop of seedlings.

the lawn. Large evergreens, that can be removed with certainty of success, can never be so well procured by transplanting from shrubberies, or other places where they have been for some years established, as by preparing them in the Nursery. All such, therefore, as it is intended to remove, perhaps a year hence, to such situations as above noticed, should be now replanted into a piece of the softest and richest of the nursery ground, in order that they may make a profusion of small fibres, by the arrival of the lifting time. Plants of the above description should stand free and unconfined on all sides. A few of them, therefore, will fill a considerable space of ground in the Nursery. This space, however, ought cheerfully to be given; for if they be crowded here, it will require several years before they recover their verdure on the sides which were confined, if ever they recover it.

Such Evergreens, as Hollies of sorts, Yews, Laurels of sorts, Boxes, or the like, which it is wished to prepare for large plants, for occasional demands of the above description, should, if they have stood two or three years since they were planted out, be replanted in such soil as above recommended. They must, like the above, have plenty of room, lest they become naked on any of their sides. There are few articles on which the nobleman or gentleman's nurseryman can put his hand, which, at the time of lifting to their ultimate

station, are more anxiously desired to prosper, than the above kinds of plants; therefore, too much pains can hardly be bestowed on their preparation.

DIGGING AND CROPPING VACANT GROUND.

By the removal of the Evergreens to the forest plantations, there will now be several vacant quarters in the Nursery. Some part of these will be required in June for sowing Elm seeds; some in September, for transplanting Firs and other Evergreens, as well as for sowing seeds from the rot-heap. Such ground as is intended for these purposes, should, without loss of time, be dug over as rough as possible; and such parts as will not be required before the spring months, may now be prepared for yellow turnips, late peas, savoy, or potatoes, according as circumstances may point out.

WATCHING THE BIRDS.

This will now be a most important work. The first sown Firs and Larches will just be breaking the ground, or *briering*, with the husks of the seeds still on their tops,—a crisis most inviting to the chaffinch, the green linnet or green grosbeak, the red linnet or greater redpole, the yellow-

hammer, and even the sky-lark. Not one of these is therefore to be allowed to alight upon the beds ; nor, indeed, ought any other bird. This will require attention from the break of day to sunset, without intermission, till the plants throw off the husks. This is certainly a hard part of the nurseryman's duty, but it is a most indispensable one.

DESTROYING MICE.

After Acorns, Chesnuts, Beech-mast, Hazles, Nuts, and Fir seeds have *briered*, mice and birds are no longer to be dreaded as enemies to them. In respect to these, therefore, the nurseryman's anxiety and labour may for some time be dispensed with ; and, whoever has had experience of the task, will think it high time.

HOEING AND CLEANING.

The rising weeds, on every hand, will be calling loudly for the application of the hoe. This is a work not to be dispensed with. Every dry day, or even part of a dry day, must be improved ; for, if the weeds be allowed to get ahead at this time, farewell to all pleasure or profit in the Nursery for the season ! Nothing surely can be more galling to a nurseryman, who has any feeling, than to see his ground overrun with weeds.

When he ceases to be moved with this sight, he is callous indeed ! Sometimes, however, it is not his fault. From our previous observations and directions in this department, it will appear that a very small space of ground requires a vast deal of labour and attention. No nurseryman should therefore be oppressed with too much or be refused a sufficient command of hands, to accomplish every piece of work in its proper season. Indeed, the master who gives his nurseryman too little help to do his work completely, is his own punisher ; because, in that case, it must be hurried over in an imperfect manner, and sometimes will not be done at all. If the nurseryman has any feeling or sense of character, he becomes disheartened ; the consequence is, that he takes the first opportunity to move from the place. A like conduct to another servant in a subsequent year, produces a like removal. The person, therefore, who works the ground, is constantly unacquainted with its powers ; his attachment to, and interest in it, are slight, and never get established.

It is, in truth, of the utmost advantage to the nursery, to be under one system of management ; and greatly to the credit, both of the employer and his nurseryman, that he remain *for ever* in the same place ! We may be permitted here to remark, that neither master nor servant should quit

with one another on any *supposed* ground of difference, nor even upon *slight* offences on either side. He knows little of the world, either as master or man, who expects to get through it, without encountering difficulties of this kind ; and he who cannot pass over a slight offence, gives himself unnecessary pain and trouble.

ORNAMENTAL PLANTATIONS.

PLANTING OUT LARGE EVERGREENS ON THE LAWN, &c.

THE planting of such must be forthwith completed. In the disposing of these, *Taste* has its fullest play. It would, perhaps, be impossible to convey an idea of the exact position in which the plants to be used should be placed. The general flatness, or the number and degree of the inequalities of the ground ; the number and qualities of adjoining plantations, together with their relative situations ; a distant village, or a distant parish church or spire ; or, perhaps, a farm-house ; or far distant mountains or hills, with a variety of other objects and circumstances—must determine the tinges of hue, the position, the number, na-

tural heights, and qualities of the plants to be used. Any attempt, therefore, to lay down, in this place, the exact situations in which the respective Evergreens should be placed, would be ridiculous.

It may, however, be humbly suggested, that the Park or the Lawn, should never be daubed too full of groups, or of single plants. When there are too many put in, the whole park acquires a confined air and appearance; and, whatever be the intrinsic worth of the plants individually considered, the eye turns from the appearance with dislike.

Single plants, it is presumed, never produce in the mind that sociable feeling which a small group creates. Groups, however, should never assume any regular figure, or appear at all artificial. The eye and general taste require, that they be after the manner of Nature's works, wild and irregular. Groups, therefore, should vary in number, and stature—in shades of colour and in figure, as they recede from, or approach, the Mansion-house.

The flowering Evergreen shrubs of low growth, (such as the *Laurustinus*, and different species of *Rhododendron*), should be placed nearer the eye, or perhaps on the brow of a somewhat distant knoll, or on the brink of a rivulet near a walk, that, in the stroll of the evening, the wanderer may be surprised and pleased.

It would be in vain to attempt the diversity and variety above hinted at, in a small piece of ground of perhaps an acre or two. There all is probably seen at a glance. In such small places, therefore, the plants and variety must be suited to the nearness of situation, and other circumstances.

In whatever position it be found necessary to plant Evergreen trees and shrubs, care must be taken to procure the requisite soils, if they are not naturally present.

TREATMENT OF NEW PLANTED DECIDUOUS ORNAMENTAL TREES.

Lately planted hedge-row, and detached ornamental trees, are liable to be windwaved. They should, therefore, be examined, and such as are blown to a side should be placed upright, and so held till *dry* earth be *trindled* in around them at the roots, and be made moderately firm, by beating it downwards with the end of a stick.

If the situations in which these or the Evergreens have been planted, be naturally gravelly or porous; and if dry weather succeed, they will require occasional waterings; and more especially, if the plants are of large size. This attention will conduce, not only to keep the plants alive, but to give them more strength and bolder verdure.

CROPPING THE GROUND AMONG NEW PLANTED
ORNAMENTAL STRIPES, &c.

In such screen or other ornamental plantations as have been prepared by fallow, trenching or digging, and in which it is intended to raise field or yellow turnip, the end of this month is the proper time for sowing. A small patch between the plants in the middle of the space only, should be sown. Potatoes also may yet be planted among them, or late cabbage for feeding cattle in winter,

PREPARING GROUND FOR FUTURE PLANTATIONS.

We have before noticed the intimate relation between ornamental and ordinary forest plantation ; and as we have already, under this head, as well as under *Forest Plantation for May*, treated largely on the preparation of grounds for future plantations, we shall for the present refer the reader to these places.

Sometimes it is necessary to form a narrow stripe, by opening a ditch on each side, turning the earth inwards. In this case, the outer sides of the surface are rendered high, while the middle is left low. In moist soils, it may therefore follow, that the middle, or lowest place of the

stripe, will be too wet. This is sure to be the case, if the stripe be in the direction of the declivity of the ground. It is therefore essential, for the health of the trees, that a sufficient number of cross drains and outlets, to carry off the accumulating water, be made into the side ditches. In multitudes of instances through the country, the trees are found sickly, or dead, in such stripes as the above, when proper outlets have not been made.



FOREST PLANTATIONS.

PLANTING EVERGREENS.

All the plantations which require to be finished with Evergreen trees, should be immediately completed. Indeed, in but very few cases is it advisable to leave the planting of such undone till this late period of the season. Damp weather for removing and planting these is now greatly to be desired. If it be necessary to go on with it in dry weather, *puddle* must be resorted to, as directed for last month ; which see.

CROPPING WITH VEGETABLES AMONG FOREST PLANTATIONS.

Wherever cropping with potatoes among new planted forest trees after fallow is intended, they should now be planted. Turnip of various sorts may also now be sown. For further particulars, see *Ornamental Plantations* for this month.

PREPARING THE GROUND FOR FUTURE PLANTATIONS.

It has frequently been noticed, that this is the best season of the year for preparation of the land for future plantations, by *Pitting*, *Fallowing*, and *Paring and Burning*. This subject will therefore divide itself into many particulars under these heads.

It must be obvious to every one who has been engaged in cultivating forest timber, that trees grow, for several years after planting, with far greater rapidity, in land which has been prepared by fallow, than in equal soils after pitting; and far better after pitting, than by being merely slit-
ted in. Nevertheless, we would by no means wish to be understood as recommending generally the preparation of ground for forest plantations by fallow. Indeed, the expence would be extravagant; and, were it otherwise, the work is im-

practicable. Generally speaking, fallow for forest plantation is not to be looked for. Pitting may be considered as the most perfect method of preparation that extensive tracts of ground for forest plantation can receive ; and that, too, only where hard-wood trees, as principals, are either to be planted or sown, it having been already mentioned that the nurses may be *slitted in* with propriety. Indeed, in the event of sowing forests with all sorts of trees, pitting must be resorted to. Paring and burning, therefore, together with its concomitant fallow, is intended principally for grounds to be used either as Coppice, Grove, or Ornamental Plantations.

Paring and Burning.

This species of preparation, as above hinted, is principally to be adopted in preparing for the last-mentioned kinds of plantation. Yet, in many instances, it may be required for completing a district of forest plantation, or when it is required to advance with more rapidity ; and it is especially useful in mossy, or sub-mossy soils, which are covered with coarse grasses.

The speediest and cheapest, as well as the most effectual method of paring, is by the plough. Any ordinary plough may be made to do the work, by simply enlarging the sock to nine inches at the back end, and making the cutting point and an-

gles very sharp. The coulter should be made sharp on the point, and especially so where it has to cut the sward. When the plough is duly prepared as above, the sward may be pared with it as thin as is wished. The turf, however, should not be more than two inches thick, otherwise it would require so long a time to dry, that the season for burning, and other operations, might be lost. It will be found a great means of forwarding its preparation for burning, to cross-cut it, perhaps a fortnight after the first ploughing; only the whole should be dry at the time of performing the cross-ploughing.

After the turf is dry enough for burning*, the furrows are to be lighted on the side of the field from which the wind is blowing; and it is proper to wait till it blow from the most steady point. The whole is to be attended to during this operation; and, when the progress of the fire is impeded at any place, perhaps by a damp spot, it must be lighted on the other side. So soon as the burning is over, and the heat abated, the land should be wrought like ordinary fallow; being, however, careful not to plough too deep for the present. Before the winter arrive, it should be laid up in ridges, of such a breadth as circumstances may

* The common method is to collect the pieces into small heaps, and set them on fire, adding more pieces as circumstances may require; and when the heaps are sufficiently burned, the ashes are spread abroad over the surface.

require ; and the ridges should lie in such a direction as to lay the whole surface as dry as possible.

Some surfaces answer better to be pared in autumn or winter, and left with the earth side exposed during frosts and rains : The cross-cutting of such is generally deferred till summer, just before the turf is to be burnt. Where the soil is naturally unfavourable for burning, this method will be found of great use ; because the action of the weather, during winter and spring, will have freed the turf in a great measure from the adhering particles of earth, and so left it in a state more fit for burning than otherwise it could be.

Many cases will nevertheless occur, where the method of paring above recommended will not be practicable ; in some instances, for want of firmness, and, in others, from the unevenness of the surface : in which cases, recourse must be had to paring in the ordinary way ; which is too well known, to require description.

If the grounds now under consideration be found very much inclined to moss ; or if they are too soft for being planted or sown in the following spring with trees or tree seeds, a crop of oats may be taken, which will give the surface a greater consistency, and reduce the mossy substance more perfectly to earth. After the separation of the crop of oats, the land should receive a furrow, in which it should lie till spring, when it is to be finally prepared for planting or sowing. 8

We are aware that many arguments have been advanced against burning the coarse swards of such ground as above noticed. But experience has led us to recommend it as highly useful on such soils, in raising trees ; and we have at present no further business with it.

FALLOWING GROUNDS.

If the grounds proposed to be summer-fallowed for the purposes at present under view, will at all bear a crop of oats, it should be taken previous to fallowing. Without a crop to reduce and rot the sward, there is, in many cases, hardly a possibility of bringing it to a good mould in one season. And if the sward cannot be properly reduced, and the weeds destroyed, without two years labour, the advantage is evidently on the side of taking the oats, which will allow it to be reduced with ease in the following season. All stripes of plantation, or parts of a large mass, which are situated near a residence, ought to be prepared by fallow, if it be required that the trees should rise with speed in their infancy. In cases where their early progress can be considered as a matter of indifference, pitting, as for ordinary forest plantation, may be adopted.

PREPARING GROUNDS BY PITTING, BOTH FOR PRINCIPALS AND NURSES.

This method, next to fallow, is the best. If the design be extensive, and the soil various, the

methods of management attendant on pitting must vary in proportion. The distances at which the pits are to be made, must be regulated by the circumstances of the quality of soil, and the degree of natural shelter.

On such parts as are very much exposed, the pits should not be at a greater distance than three and a half feet, nor nearer than three feet. On places less exposed, and where the soil is good, they may stand at the distance of four and a half, or, in very fine land, and where the shelter is greater, at five feet distance; and this is the greatest distance at which trees should stand in any new planted grounds, however favourable the soil and situation may be.

In a plantation of the extent and variety of soils at present under our view, it cannot be expected that the same rule of pitting will every where apply; neither would the success be equal, if all soils were pitted in the same manner.

In light, porous soils, the surface of the pit should be pared thin off, and laid in the bottom of the last made pit, with its green side undermost, and the earth laid on above it; because, by this means, the sward will be fully reduced to earth by the planting season in the following spring; and the soil will be, in some measure, fallowed in the pits. This method is essential in all thin soils.

But if the soil to be pitted be strong, stubborn clay, with a tough sward, it may be proper to

place the turf, pared off as above, in the bottom of the last made pit, and only a small portion of the soil above it, in order to facilitate the rotting of the sward; but the remainder of the soil from the pit must be laid on the surface, at the edge of it, that it may there receive all the benefit of the summer and winter weather, to pulverize and meliorate it; while, at the same time, the sides of the pit, and the portion of soil placed over the turf in the bottom of the pit, are equally exposed to the beneficial action of the air.

But, in cases where the surface is too strong and coarse to be reduced to earth, by the time of planting in the above manner, and yet where the soil is a strong clay, as above, the surface must be pared off as thin as possible, and discarded. In this case, the whole contents of the pit, are to be laid upon the surface at its edge, which will expose all the inside of the pit, together with the soil so dug out, to the action of the weather; will likewise greatly pulverize and meliorate the earth, and make it a more fit receptacle for the purposed occupier than any other method of management will.

In spots of land, which have formerly lain in a wet or sour state, and which have a coarse spritty sward upon them, the surface of the pit is to be thrown aside, and its contents exposed as above. Indeed, such soils, although of a lighter nature than that previously noticed, require, even more than it, the summer's melioration.

Such portions of land as are of the nature of moss, will require a very different treatment from either of the above. It is well known to every one, that moss dug out, and exposed to the drought of summer, forms peat: And there are few people conversant with plants, and their food, who do not know, that peats (as such) are totally incapable of supporting vegetable life. If, then, the surface of mossy land were pared off, and the contents exposed as above, in the case of stubborn clay, and sour bog earth, its contents would be formed into a substance far less capable of supporting vegetable life, than before it was dug out. Wherever, then, mossy ground occurs, the surface of the pit is to be pared off three or four inches deep in a *whole* turf; the pits are to be dug just now, the one being filled out of the other, excepting the turf pared off as above, which is to be placed carefully above the mossy earth in the last filled up pit, so as to exclude the severe action of the drought of summer; for, if the contents of the pit be exposed to this action, they become hardened, and converted into a substance nearly resembling peat, even although containing a considerable portion of earthy particles; while, if protected from the drought by the covering of turf, they undergo a gradual decomposition, which they never would have experienced under different circumstances; and the pits will thus be better fitted to receive plants in the coming spring, than by any other manner of pitting such soils that we are acquainted with.

Nevertheless, if such mossy grounds are of considerable extent, we would recommend their being pared and burnt, as above advised; and the more so if they be very much inclined to moss; and especially if they be covered with very coarse grasses and carices. The depth of the pits, in the present case, ought not to be above a foot. Moss charged with its natural moisture, must be drained previous to pitting, otherwise it will receive little benefit by that operation. The depth of the pits for the clay soil, provided there be no variation of quality from the surface downwards, may also be a foot; but if the soil change, at six or eight inches, to a crude unfriendly substratum, the pit should not be deepened above two or three inches into such subsoil: However, in pitting any land, the sward of which contains all the soil apparently fit for supporting vegetation, it will be necessary to bury the sward in the bottom of the pit, and cover it with three or four inches of the bad subsoil, in order to promote the decomposition of the sward. The breadth of the pits ought not to be less than twelve inches; nor need they be more than fifteen. In digging any pit, the bottom should be kept as wide as the top.

On many rocky spots of the proposed plantation, pitting may be impracticable, on account of the stones which are mixed with the earth. In such cases, the *planting-mattock* must be resorted to. By this instrument, you skin off the surface for six or eight inches diameter, and with the pick-

end dig down six or eight inches deep, bringing up any loose stones to the surface ; by which means a place will be prepared for the reception of the plant, little inferior to a pit, and that, too, where a pit would be made with a great deal of difficulty by the spade in the ordinary way. Indeed, this instrument may be used in many cases, when the plants to be planted are of small size, such as one year Larch seedlings one-year nursed, or two-year Scots Firs one-year nursed ; and the expence is much less than by the spade, as stated more fully under the following article.

PITTING GROUND FOR PRINCIPALS ONLY.

It has been hinted above, that preparation by fallow, or pitting, is useful in securing more perfectly the growth of the plants, and in giving them a more rapid progress in the first period after their planting. But it has not appeared to us, that preparation, of any kind whatever, has altered the natural value of the timber, or increased its longevity a single year. Trees that we planted twenty-six years ago with the diamond-pointed dibble, as mentioned above, are just now fully as healthy, as tall, and as vigorous as those which were planted, after pitting, in the same soil and climate, at the same time ; although the pitted plants were several years nursed, while the others were only seedlings. Pitting, therefore, will not materially af-

fect the size of the plants, or give them, after the lapse of twenty years, an ascendancy of size over those planted at the same time in equal soil by the dibble, provided the small dibbled plants can rise at all for the herbage.

We admit, that young plants planted in the forest by the diamond-pointed dibble, or by the T method, are more liable to die the first year after planting, than those that are planted after pitting. Hence, we would recommend the pitting, (even in the most extensive forests), for the hard-wood kinds. The observations which we have made above, respecting general pitting, will regulate the manner of pitting under the present head.

The distance of the pits from each other must be determined by the nature of the soil. But, as formerly observed, if the principals are planted at the distance of nine feet, they will, at such a distance, after the removal of the nurses, have sufficient room to grow to timber of considerable magnitude; or, at least, to such a size as would be useful for many purposes.

If, however, the land to be planted were very favourable to growing larches, the hard-wood might be planted at fifteen feet apart, and the interspaces be filled up with larch nurses; some of which might be allowed to grow with the principals till they were of very considerable size: These, when felled out, would allow the hard-wood to stand at such a distance as to become very large timber

trees. By pursuing this method, a vast extent of ground can be planted at a small expence, and with certainty of success. We have, in observations on this subject in *January*, mentioned, that both Scots firs, and larches for nurses, should be small plants. Indeed, large plants, with very bushy roots, can never be slitted in with propriety; but plants, of the sizes formerly mentioned, certainly can.

PITTING FOR SOWING ACORNS AMONG NEW PLANTED NURSES, &c.

We have formerly mentioned the advantages of raising forest timber trees from seeds without transplantation, especially oaks, and other perpendicularly rooting sorts. Such may be sown in the same spring in which the nurses are planted, or deferred for a season or two, according as the circumstances of an exposed or a sheltered situation may direct.

The distance between the pits, for sowing acorns in the forest, must depend on the ultimate views: If it be intended simply to raise an oak wood, they may be made at the distance of nine feet; but if it be intended to raise a copse, they should not be farther distant from each other than six feet. The making of the pits, for sowing acorns, must be regulated by the same circumstances as to distances, and the melioration of the soil, as mentioned above for general pitting.

PITTING FOR SOWING FORESTS OF FIRS AND
LARCHES.

The observations made above, in respect to the distance between the pits in general pitting, apply to the present head. Indeed, the whole that is there said will apply in the present case, excepting in respect to the depth of the pits. Both for general planting, and for sowing acorns, we have advised to dig up several inches of the subsoil, even although it may appear unfriendly to vegetation; and this was proper; because it was plants that were to be introduced, and seeds of a very hardy kind, which required to be buried several inches under the surface, and whose roots would consequently be imbedded in what good soil there might be. But in the present case, we are to pit for very tender seeds, which require all the encouragement and care which it is in our power to give; Therefore, we cannot advise, in any case, the making of the pits deeper than the natural soil, however little that may be. If the sward contain the whole good soil, it should be turned upon its green side, and wrought by the hoe, or other means, for two years, if one is not sufficient to qualify it for the reception of the seeds.

furrow, will answer perfectly well. The very first step necessary to be taken in any preparation, is the formation of drains, wherever they appear to be necessary. Pitting and other works follow with greater propriety than precede this work.

THINNING OAK WOODS.

We have formerly recommended that the Thinning out of Oak Woods, as well as the general thinning out of oaks over any part of the plantations, should be left undone till this time, for the sake of getting off the bark with the greater facility. We have already, in *January*, given directions for thinning forests of various ages: These will equally apply here; we shall therefore refer the reader to them.

CLEANING THE GROUND AMONG NEW PLANTED TREES.

We have previously pointed out, that cropping with vegetables among young ornamental plantations made after fallow, trenching or digging, is only intended to induce a more close attention to keeping them clean. Such plantations, then, as are to be kept with the hoe, will now require to be attended to. In the performance of this

work, hoes of considerable weight, and not broad in the mouth, will answer best ; because thereby the surface can be more effectually stirred or renewed, than by ordinary garden hoes. Indeed, in land of a clayey or strong nature, hoes of the above description are essential to the proper performance of the work of hoeing.

OAK WOODS AND COPSES.

PLANTING EVERGREEN NURSES.

IN all cases where Oak woods or Copses have been laid out by sowing in pits, and where Fir nurses are to be planted, and have not hitherto been got accomplished, the nurses ought to be completed without delay, as advised last month ; which see.

The season is now arrived for singling the shoots on the Oak stools ; for thinning out Oak woods and Copses ; and for taking the bark off the timber.

SINGLING THE SHOOTS ON THE OAK STOOLS.

The stools which were cut over two years ago, will by this time have produced a great number of shoots. If these were left upon the stools untouched, they would unnecessarily exhaust the strength of the roots in producing brushwood hardly fit for the fire; while, by a moderate degree of care, it may be turned to far more important ends.

The first thing necessary to be considered, is the strength of the stool to be thinned; and, in proportion to this, to leave a greater or smaller number of shoots upon it. The number to be left may vary from one to four or five. Whatever number are to be left, they ought to be the straightest and most promising shoots, and as equally disposed around the stool as possible.

The necessity of retaining a sufficient number of shoots will appear obvious to every one. If a number too small for conducting the whole flow of juices from the roots upwards be left, these juices will seek an outlet, by forming new shoots at the places from which their predecessors were removed; by which means, the evil sought to be prevented would be effectually continued. On the other hand, if too great a number be left, they prevent the necessary enlargement of the princi-

pals, and become themselves stunted, hide-bound, and dwarfish. To guard against running into either of these extremes, is the business of the forester in the present case.

Such of the young shoots as it is necessary to remove, should be slipped off by a wedge-shaped chisel, furnished with a handle three feet long. Pushing them off by the chisel as above, is by far a better method than cutting them; because, wherever they are *cut* off, the stools produce a greater profusion of new shoots, which both needlessly throws away the strength of the stool, and robs those shoots intended for the crop of a part of their nourishment.

Having selected the proper shoots to remain on the stools, and removed, by the chisel, all redundant ones, nothing further is necessary to be done for them, till the proper season for pruning them arrives in autumn, when they must be trimmed, as directed for forest plantations of their age and size.

Stools which have been thus treated two years ago, should now be cleared of all young growths which have since risen up. Indeed, it were better, both for the stools and *wauers*, that the superfluous young growths were annually removed.

Stools which have stood still two years longer, and which have been treated as above directed,

must now be freed from some of those saplings which were left at the first thinning. In cases where five were left, two may be removed; and these of course the worst. The three which are left should be chosen to stand as equally disposed around the stool as possible. Those which were left with four upon them, should now be freed from two of the worst; and the two left should be as nearly opposite to each other on the stool as possible. After this thinning, the plants or wavers left, will require nothing more till the time of commencing the autumn pruning, when they must be treated as directed for forest plants of their height.

If the proposed object be a Copse, little more will be required, till the time for cutting it down arrive, which may happen about fifteen or twenty years after the last felling took place. But its fitness for being cut at this age, will depend on the goodness of the soil, the climate, and the management of the whole.

CONVERTING A COPSE INTO AN OAK WOOD.

If, however, it were advisable, from local circumstances, to rear an Oak wood from the stools, which have been treated as above directed; it would be necessary to remove one third part of the whole *stands* by the twelfth year after cutting as above, which would thin them out to between seven and eight feet distance, one with another.

In all cases where it is required to deprive a stool of its leader, it must be managed with the same care and attention to its future growth, as has been already advised. The stools so deprived of their leaders must be kept unincumbered by any brushwood, dead branches, or the like, in order that its young shoots may proceed onward without interruption.

By their twentieth year, another third part may be removed, which will allow the remaining stands to be at the distance of nine or ten feet apart; and by their twenty-fifth year, perhaps, they may require to be thinned out to twenty or twenty-five feet distance; and, five years thence, the remaining stands may require to be thinned out to thirty feet distance: Which distance will probably answer till they arrive at their fortieth year, when they may be thinned out to about forty feet distance from one another.

The stools produced by these intermediate thinings, and which have been managed as directed above, will by this time have produced a plentiful crop of young saplings for supplying the places of such trees as it may be necessary from time to time to remove: and thus, by a simple method and moderate care, may copses be converted not only into woods, but it may be said into everlasting woods *.

* Although we look forward for a great length of time during which the roots of the oak will supply nourishment to the

TAKING DOWN OLD OAKS FROM SUCH WOODS AS
THE ABOVE.

In taking down old oak trees in such a plantation as the above, great care is to be had not to hurt the young wavers or underwood which are rising up. The tops of such trees as are to be felled, should be much reduced in size immediately before the felling take place, so that they may occupy less room in their fall.

The height at which the trees should be cut above the surface of the ground is four inches : if more stem be left, it is unnecessary ; and if less, the subsequent growths cannot be managed with so much ease. The edges of the cut part left in the ground should be so pared or rounded by the adz as to turn the rain readily off ; for if moisture were allowed to lodge upon the stools, they would be seriously injured by it. No part of the bark should on any account be peeled off the root, as some greedy foresters do, greatly to the detriment of the succeeding crop. In taking down the trees, it is even proper to guard against their accidentally tearing off any of the bark from the roots.

saplings at intermediate cuttings, and produce these to good timber trees, the time will doubtless arrive when these, through age, will become rigid and incapable of performing their functions. Every tree with which we are yet acquainted, has evidently its periods of infancy, youth, maturity, decay and death.

BARKING OAK WOOD.

We shall suppose that the forester, with his best instructed men, are busily engaged in the respective works noticed in the preceding article, according to the circumstances of the age of the copse or plantation ; and that he has procured a proper number of *barkers*, according to the extent of his undertaking. A piece of vacant ground, at a convenient side of the wood, is to be looked out, to which the large and small wood is to be carried, here to undergo the operation of barking. The barkers are furnished with light short handled mallets made of ash-wood, the head about eight inches long, three inches in diameter at the face, and the other end blunt, but somewhat wedge-shaped ; and with sharp wedges, made of the same sort of timber, somewhat spatula-shaped : these, from their form, may either be drove by the mallet, or pushed by the hand. The barkers are also provided with a smooth whinstone, about six or eight inches in diameter on the face, and four or five inches thick.

The young saplings, small branches or twigs, are held by one hand on the stone, and with the other beat by the mallet, until the bark be split on the wood : it is then peeled off, and laid regularly aside, till a bundle of considerable size be formed.

The larger branches, young trees, and full grown timber trees, are laid along on the ground :

the upper side of the tree to be barked is beat with force by the mallet from one end of the tree to the other. The bark is then started at the thick end by thrusting or driving in the wedge ; which being thrust along the whole length, the bark is speedily ripped open.

The wedge is then applied under the bark at both sides of the incision. The firm parts are then successively beat by the mallet, and the wedge gradually pushed along till the whole be completely severed from the timber.

The point most particularly to be observed in this art, is the taking off the bark in as long shreds as possible, for the conveniency of carriage to, and drying it on what are called the *horses*.

These are formed of long branches, and two or more pieces of about a yard in length, sharpened at one end, and having a *knag* or fork at the other to receive and support the long branch.

The horses may stand within four or five feet of each other, and so as to have a declivity from one end to the other, that the occasional rains may the more easily run off. A dry elevated spot, in an airy place, is the most proper for erecting the horses upon, in order that the bark, when laid upon them, may have a free circulation of air when drying.

At the end of each day's work, the bark is carried to and laid across the horses, to the thickness of six or eight inches. The large *boardy*

pieces of bark are built into small pyramidal stacks, or set up on end leaning against the horses. If the weather be very dry and fine, the bark should be turned twice a day, or at least once a day. Gentle showers are found beneficial to it: while severe rains, of long continuance, are very hurtful. A careful *hagman* will take pains to lay the strong boardy pieces of the bark in such a manner as to defend the more tender parts from severe rains. Great care is to be used to preserve the colour of the inner bark; because the colour of this is generally looked to as a principal criterion of its value. It is chiefly by the colour of the inner bark, and the astringent effects which it produces upon the palate when tasted, that the merchant or tanner judges of the value of the bark. If, therefore, by the vicissitudes of the weather, or the neglect of the *hagman*, the bark be blemished even in colour, its value is very much diminished.

When it is sufficiently dry to be in no danger of fermentation, it should be carried to a dry house or shed. Where such cannot be had, it should be stacked up in the same manner as hay. It may be proper to notice here, that stacks of bark should not be so large as to incur the risk of their fermenting. Narrow and long stacks will answer best. After being built up, they should be instantly thatched, however promising the weather may be. Straw, bog-reed, long heath or broom,

may with equal propriety be the material employed as thatch.

The only difference in barking the Birch, from the above method recommended for the Oak, consists in peeling off and rejecting the outer shreddy bark.

The whole Bark of the Huntingdon and Bedford Willows, the Black Poplar, and the Spanish Chesnut, is preserved as above recommended for the Oak. We have elsewhere noticed, that March and April are the proper months for barking these.

CROPPING WITH VEGETABLES AMONG NEW SOWN WOODS AND COPSES.

In all cases where copses have been sown after summer fallow, and where it has been purposed to sow crops of turnips, they should forthwith be put in. We have elsewhere noticed, that the yellow garden turnip is preferable to the common field sort; the Swedish turnip is also a more fit plant to be cultivated here than the common sorts. Savoy or late cabbages may also now be planted; but, in case of putting in these, it would be proper not to exceed two rows between the two lines of patches: for if they were planted very near the rising trees, they would rob them sadly, and their leaves would overshadow them too much.

PREPARING GROUND FOR FUTURE WOODS AND
COPSES.

This subject has been pretty fully treated of in *January*, and also in the subsequent month. However, we may here observe, that in all cases where it is proposed to rear oak copses from seeds by pitting, the pitting should be performed at this time, that the soil may be more perfectly prepared and meliorated. The manner and nature of pitting various soils, has been treated of under *Forest Plantations* for last month; to which we refer the reader.

CLEANING COPSES OF CHIPS AND SMALL TWIGS.

In all cases, copses and woods, young and old, should be rid of all twigs and small branches that may have been left or dropt. Young copses especially, which have been, or are now to be sown out with clover seeds, require that this work be attended to.

SOWING OUT OF COPSES, FOUR OR FIVE YEARS
OLD, WITH CLOVER AND RYE-GRASS SEEDS.

This is now a proper season for sowing down copses of this age with grass seeds. It will be found the best method to plough for this purpose,

N C E S.

[*May.*

the middle of the space between the rows: Because, in this way, the ground is kept more perfectly clear of any other method of preparing the grass seeds. Under this article

for last month, it was noticed, that it is much better to fill the ground with clover, than to allow it to be filled perhaps with much worse kinds of herbage, which might be far more scourging to the ground, as well as less useful to the owners. It may be proper to observe here, that it will be dangerous to use the harrow for covering in the grass seeds: that work must therefore be performed by a rake pretty wide between the teeth.

F E N C E S.

PLANTING HEDGES.

In all cases the planting of evergreen hedges and fences should be finished by the first of this month, any delay beyond that period is attended with danger to their growth. Be attentive to embrace damp weather for the performance of this work: Lifting and planting them in damp weather, will both secure the progress of their growth, and also prevent many of them from dy-

ing. In the event of the weather being dry, resort to puddling, as recommended in the *Nursery* for last month ; and see that you do not have more plants taken up of a morning than you can plant out the same day ; and even these are to be carefully covered with mats, if the weather be dry, for fear of overdrying, and thereby injuring their roots.

BUILDING DIKES.

Continue the building of stone and lime fences, top dikes, Galloway dikes, and drystone walls. Make sunk fences, and build sunk-fence walls. Be careful to use large stones in building sunk-fence walls ; especially if the *cast* be deep. See that proper apertures be left at numerous places for the escape of the moisture, which will infallibly exude from the earth on the back side of the wall. For want of attending to these precautions, many roods of sunk-fence wall are sometimes overturned soon after being built. In all cases where there is occasion to make up the earth at the back of sunk-fence walls, the wall at such places must be made much stronger than when they are merely employed in facing up the solid earth ; because travelled earth, when it becomes moist, swells to a greater degree than solid earth, and therefore requires a very strong wall to withstand its force.

CLEANING HEDGES.

By this time the cleaning of hedges will have become a work of great importance. The keeping of hedges clean is the most effectual means to secure their health, and to hasten their maturity. All winter planted and dressed hedges, which have not been cleaned out last month, will now require to be cleaned. A week spent in this work at this time, will be of more advantage to the hedges, than a whole month four weeks hence. The greatest error a hedger can be guilty of, in managing his hedges, is to allow the weeds to become rank before he begins the operation of cleaning.

The Whin hedges which were sown in March, will now be making their appearance, and would be much the better for being hoed a little on each side of the drill: The rising plants will thereby be greatly encouraged, and the weeds, which might otherwise overtop them, will be removed. They may, however, still require another dressing during the summer, especially if the land abound in thistles, particularly the welter and way thistles: These should be frequently removed in the first season after sowing; but such hedges rarely require any further attention, in the way of cleaning, in after seasons.

JUNE.

June.

THE NURSERY.

HOEING DOWN WEEDS.

UNDER this article for last month, we advised early attention to this work. Nothing is more conducive to the health and progress of the young plants, than an early attention to hoeing, whether the land be weedy or not.

WEEDING BEDS OF FIRS, &c.

Last month, under this article, we noticed the necessity of picking out the weeds from the beds of the late sown firs and larches. This work should be continued with great care. As soon as the weeds have shown themselves, they should be picked out. The work of weeding and watching the birds may go on together. The same attention to weeding all sorts of *briering* tree seeds is required. Indeed, universal cleanliness, in this respect, all over the nursery, is required; and any nurseryman

who wishes himself to be esteemed in his profession, although he were indifferent to the fate of his plants, will study to have his nursery in good order, as far as weeds are concerned.

WATCHING BIRDS.

The utmost vigilance is required at this crisis : it is a loss at any time when birds pick up seeds that are sown : But the loss is much greater when they are allowed to destroy those vegetating seeds or embryo plants which first appear above ground. These will always be found to have been the best and most perfect seeds ; and consequently the most choice plants are destroyed when birds are suffered to pick them up. What is here said respects not only firs and larches, but all the other kinds of which the birds are fond. Hence the necessity of a constant and uninterrupted attention in this respect.

RELIEVING VEGETATING SEEDS.

As noticed last month, this operation is sometimes required. When it is so, it is always a great misfortune to the young plants. However carefully it be performed, it will prove the destruction of many of them. It should therefore be resorted to only in cases of great urgency.

WATERING VEGETATING SEEDS.

Very often, at this season, severe droughts set in, which are very prejudicial to *briering* firs and other small seeds. But although drought is a very great distress, watering seldom or never is of much benefit; the drought of the following day generally leaving the ground in a worse state after the watering than it was in before. Indeed, unless the watered ground can be shaded from the powerful rays of the sun through the day, and from the probably frosty winds of the night, watering had much better be omitted. In sandy soils, which are not apt to batter, watering is of most use to the vegetating plants.

GATHERING ELM SEED FOR IMMEDIATE SOWING.

By the second week of this month elm seed will be ready to be gathered for immediate sowing. That which is of a good quality is easily known, by the seed being hard and firm in the middle of the capsule. It is mispent time to gather such seeds as are otherwise.

Elm-seed, when newly gathered, especially at this season, and kept together in a large quantity, has, on account of the juicy nature of its capsule, a great tendency to heat. It will therefore be proper to gather no more on one day than can be sown on the following morning; and it will even be right to spread the seeds thin during the night,

The necessity of this precaution generally shows itself: for, before they can be brought home in the evening of the day on which they are gathered, if there be a bushel or two in the sack, they will be found very hot. We have often observed them so much so, that if they had lain in that state till the morning, many of them would never have vegetated.

SOWING NEW GATHERED ELM-SEED.

The same quality of soil as recommended for sowing Elms, in March and April, is required for the seed to be now sown. The directions there given in respect to the manner of sowing, thickness of covering, &c. being equally applicable to the present, we refer the reader to those months (page 282, & *seq.*) for further information.

Gathering Elm Seeds to dry for Autumn or Spring Sowing.

By the last week of this month the elm seeds will be completely ripened, and consequently in a proper state for being gathered for drying to keep for future sowing. It is dangerous to delay the gathering of the elm seed even for a day after it is ripe; because it is very liable to be wholly blown off by the first slight gale.

In gathering elm seed, it should be chosen from the tallest and most handsome and healthy trees. Indeed, in every case seeds should be collected from the most promising and healthy trees of their kind. Plants, like animals, in some measure convey to their progeny their appearance and habits whether good or bad. Therefore, though a tree have an abundance of apparently perfect seeds, if it be either visibly diseased, or be an ill formed plant, not a seed should be collected from it. It is well known that disease and deformity in plants frequently do not prevent them from abundantly procreating their species. Indeed, in gardening, we always find that retrenching the *roots* of very healthful young plants, is the surest method to throw them into *fruit*; though such retrenchment evidently makes the plant less healthy than it previously was.

Every day's gathering of elm seed, even when it is fully ripe, requires to be spread out thin upon a dry loft floor; and afterwards to be every day turned over till it is dry enough to be kept in less room, or in sacks, mats, or the like, till the sowing time arrive. We need hardly observe, that plenty of elm seed can be had wherever trees of that kind are growing. It is elsewhere noticed, that the English Elm is propagated, either by layers or by grafting on the Scots sort, seed of it being rarely or never obtained in Britain.

ORNAMENTAL PLANTATIONS.

In such ornamental plantations as were made after summer fallow, and which were intended to have a crop of turnips among them, if these are not yet sown, they should now be put in without delay.

Lettuces may also now be sown among ornamental plantations for an autumn crop for feeding swine.

Such of these plantations as were planted up with potatoes, should be carefully cleaned by the hoe. We have frequently pointed out the great advantages to be gained by timely hoeing both to the crops and to the credit of the person who has the management of the plantation. A man is as naturally valued according to his works, as a tree is by its fruits.

Hedge-row trees, which were planted out, of a large size, should again be examined, to see if they have been again wind-waved ; and if so, the hole around their roots should be filled up afresh with dry earth, as directed last month under this article.

Ornamental evergreen trees and shrubs, planted out in the lawn this spring, should be examined, and treated as above. If they appear further to stand in need of continued waterings, these should not be withheld.

In every case where ornamental plantations are kept under the hoe, it is most important that they be not neglected at this season ; otherwise the bad effects of such neglect will become too apparent hereafter.

FOREST PLANTATIONS.

THE principal objects which demand peculiar care in this department, in this month, are, first, the new sown Oaks throughout all the plantation. The pits in which they were sown are to be examined and cleared from all encroaching herbage or underwood ; as whins, or the like. A narrow-mouthed spade, well sharpened, will answer best for chopping such off around the inside of the pit. The herbage so cut off must be removed from the pit ; and the middle, or spot where the acorns were planted, must be carefully weeded by the hand, and the vacant space around the inside of the pit should be hoed by a small garden hoe. If the young oaks have appeared, the space between them should al-

so be stirred by the same means ; the greatest care, however, is necessary in this work, not to cut over the rising plants.

The pits of sown fir seeds will also require the same attention, in regard to their being made clean from weeds. Although more recently sown than the acorns, fir seeds are so much more tender when vegetating, that they will require to be cleaned by this time. The pits may be hoed around the outside of the patch of seeds, but the patch itself must be weeded carefully by the hand.

Watching among new sown fir woods is as necessary as in the nursery, and it must be continued until the husks or integuments of the seeds be thrown off from the tops of the vegetating plants.

The pitting of grounds intended for planting next spring is still to be continued, as advised for last month ; to which we shall refer the reader.

The work of fallowing is to be continued with vigour. It is of the utmost importance to have the surface made fine during the summer, that it may be laid up in proper ridges before the autumnal and winter rains set in ; otherwise it will lie in a wet or sour state during the winter months, greatly to its hurt.

Paring and burning coarse mossy lands is also to be got forward with as much speed as possible, for the same reasons as just stated respecting the fallow.

The draining of intended plantation grounds ought now to be done. It is very improper to leave this work to the last. The summer is the best season for such operations.

In all cases where part of the young forest wood is under green crop, or under the hoe, it is necessary at this season to have it well cleaned: By such timeous attention, much after-labour will be saved.

WOODS AND COPSES.

CONTINUE the barking of Oak wood, as pointed out last month. See that the bark be well dried, and properly stacked up and thatched.

Such copses as were sown in pits among grass lands are now to be carefully weeded, as directed for such in *Forest Plantations* for this month; which see.

Fields of patches which were sown either with acorns or other tree seeds, are now to be carefully weeded and hoed, as circumstances will admit. Great care is necessary, especially in regard to small seeds, as those of Birch. And such of these as are cropped with vegetables, must be carefully weeded and hoed. Nothing, we repeat, is of more importance to all sorts of crops than early cleaning.

Those which had their patches thinned out in the last, or preceding spring months, will be greatly bettered by being hoed between the remaining plants, not merely to destroy the weeds, but to loosen and renew the surface. It has elsewhere been said, that such operations enrich the soil. Probably the land may have acquired a very hard and solid consistency; in which case, hoes made with three claws to strike into the earth, will be found of great use. Such are not only more effectual in turning over the surface, but are more easily worked than the common sort.

Continue preparations for future oak woods and copses, by pitting on unequal grounds and in grass lands. Directions for regulating this work have before been given under *Forest Plantations* for last month; to which we refer the reader (p. 381.)

The work of preparing for the sowing of woods, by paring and burning, and by fallow, should now be carried on, as recommended in last month under *Forest Plantations* (p. 377.)

FENCES.

THE whole of the hedges which were either new planted or cut down, or planted last winter and spring, are now to be examined and cleaned.

It was noticed formerly, that a day spent in destroying weeds in their infancy prevents much after labour : Besides, the stirring of the ground, in killing the weeds, greatly promotes the health and growth of the young hedge plants, and encourages those which were cut down to push forth numerous and vigorous shoots.

We need hardly repeat, that this is a proper time for carrying forward the building of fences with mortar. It may be right to hint, however, that in all cases where drystone or Galloway dikes are intended to be built, the stones should be procured and laid down while the roads are in a good state.

JULY.

July.

THE NURSERY.

TIME FOR DISCONTINUING WATCHING BIRDS.

THE whole of the new-sown beds and drills of spring-sown seeds will by this time have made their appearance ; and the Firs and Larches will have disburthened their tops of the husk of the seeds which they pushed above ground when germinating. The watching, to prevent their destruction by birds, will therefore be no longer necessary.

CLEANING NURSERY GROUNDS.

Attend, with care, to keep your Nursery ground in every place clean of weeds. If it be for a week or two neglected at this season, the annual poa grass, groundsel, chickweed, or the like, will get to a seed-bearing state, shake their seeds and so lay a foundation for much future labour.

In the operation of cleaning nursery ground, raking among transplanted trees, and in the alleys of seed-beds, &c. should be as little practised as possible. Raking increases the fineness of the mould, and, in proportion, the number of the weeds. It is a better plan to hoe and gather off the weeds by the hand; and thus the rot-heap will contain fewer small stones, and the nursery will be more easily kept clean than if otherwise managed.

MANAGEMENT OF WEEDS.

It is very wrong to lay down weeds in heaps in the Nursery. If large weeds be pulled and laid down, having the seeds formed, they will ripen, although not so perfectly as if the plants had stood in their natural spot, yet sufficiently to grow; and they will ripen much faster too, than if they had been unmoved.

We would recommend, that the vegetable mould, so procured, should not be used in manuring nursery ground, especially when it is intended to sow seeds; because, however carefully or completely the weeds in the rot-heap have been covered, a considerable number of the seeds will remain unhurt by the fermentation; and would, at length, very much tend to increase the number of weeds among the young trees; but such mould may be used with propriety in the plantations, for raising a crop of turnip, or the like.

It is therefore absolutely necessary to carry off all weeds instantly after being pulled, to some sequestered spot contiguous to the nursery ground, where they are to be laid up in a proper ridge for rotting. When the new pulled weeds are laid upon the ridge, they are to be immediately covered with a portion of those most reduced, to prevent the seeds from being blown abroad by the wind.

PRUNING PLANTS IN THE LINES.

Although the first of this month would be too early to commence the Pruning of large trees, it will now be proper to go over the young plants in the lines, and to pinch off any shoot that seems to contend with the main leader of the tree. This will be found useful, especially to trees planted last spring. Larches, and firs of this age which have two leaders, should have the weakest pinched off. This method of pruning will answer for such ages as are above noticed: But such as have been two years in the lines will require the knife. Cut the competing shoots close by the bole; being careful to leave the plant regularly clothed with small twigs. Plants so pruned at this season, have their wounds healed over before the time for removing them arrive; and so are far more proper for being sent to the plantation, than if they had undergone this operation at Martinmas.

Larches, in Nursery lines, should never have the knife applied to them, excepting in cases where two or more contending tops appear; and, even then, it will generally answer better to pinch off the top or tops of the weakest with the finger and thumb.

The same may be said of all the kinds of fir; but, indeed, these seldom, when they are of good quality, produce two leaders.

Some of the larger plants of Evergreens, in a train of preparation in the nursery for single ornamental plants, such as Holly, Yew, Box, or Laurel, may require a little pruning. This, however, must only consist in *shortening in* any over-luxuriant or *runaway* branch. Unless in the case of forming them for *trees*, they should seldom, perhaps never, have a branch taken off by the bole. But if they are intended for tall trees, they must be individually managed, as recommended for forest trees destined for the same purpose. The pruning of Evergreens should not be left undone beyond this month, or the beginning of August.

ORNAMENTAL PLANTATIONS.

MANAGEMENT OF GREEN CROPS, &c.

ATTEND to the crops of vegetables, sown or planted among the young plantations. Be careful to keep them clear of weeds;—earth up potatoes with the hoe, and single out late turnips. No crop requires more that the land should be stirred about them in their infancy than turnips. Expert growers of these do not wait till the ground becomes weedy before they hoe; but continue to work among them from the time they are in the rough leaf, till they have grown to cover the whole ground.

LIFTING EVERGREENS.

By the end of this month you may venture to lift Evergreen trees and shrubs, to fill up any vacancies in the Park, Lawn, or Shrubberies. Allow us, however, again to inculcate the propriety, or even necessity, of choosing damp or rainy weather for this operation; and of taking care that the plants be removed with as large balls of earth as

possible. If drought suddenly follow after the removal of Evergreens, they must be watered around their roots; and the water should not be supplied in a sparing manner, but such a quantity should be given as will sink down to their undermost roots.

PRUNING.

By the end of this month may be commenced the summer pruning of ornamental plantations and trees. We have often recommended cautious pruning. This is especially necessary on the exterior parts of plantations. Here, variety and elegance must, as much as possible, be preserved; while the interior of ornamental plantations may be managed like ordinary forest plantation. In pruning larches or firs at this season, or indeed at any season, great care must be taken not to remove too many branches at once. A single tier, or at most two tiers, is as much as should be taken away in one season. In all cases, larch and fir branches should be cut into the quick. Indeed, unless in the case of single ornamental trees, or such as have been neglected to be pruned in due time, cutting by the bole is essential, both to the health of the plant, and to the future procuring of good sound timber. When a large branch, which perhaps bears a considerable proportion to the whole top of the tree is to be removed, it is wrong to attempt

to remove it altogether in one season. Let it be shortened at this time at a living lateral, and let the remainder be taken away the next season, or let another part of it be then shortened off, and the final removal be protracted till a third season, as circumstances may direct. Let us here, however, observe, that the ultimate pruning must be close by the bole. Timber is not so much the object here ;—if it were, the above circumstance of lopping off so large a branch would for ever be a blemish. We would never wish to see a branch thicker than a person's wrist required to be removed from any tree whatsoever ; and good management will always procure us that pleasure. But, alas ! how little of that kind of management is to be seen !—Not one of a thousand pays any attention to the pruning of his plantations and trees, till they are almost past redemption ;—at any rate, till it is impossible to make good clean wood, and not unfrequently difficult to leave *healthy* plants, on account of the *size* and *number* of the branches necessary to be taken off. For further directions for the work of pruning, we refer the reader to *January*, (p. 147).

PREPARATION OF GROUNDS FOR FUTURE PLANTATIONS.

Continue the preparation of grounds for future Plantations, as recommended in last month. On-

ly, in cases where it is doubtful if the sward will be rotted previous to the planting time, see that it be discarded or thrown aside, as directed for *Forest Plantations*, article *Pitting*, for *May*, (p. 386.)

THINNING ORNAMENTAL PLANTATIONS.

This work will be properly continued at this season. In all cases, plants may be removed, whose bark is not to be used for tan. But such as are to be employed in this way, ought to be let stand till the proper season for barking them arrives. See *Forest Plantations for March*;—*Mixed Copses*, and *Oak Woods for May*.

FOREST PLANTATIONS.

THE whole works for preparing for Forest Plantations, recommended in *May*, may still be carried on.

Continue the care of new sown pits of seeds, as directed last month ; which see.

PRUNING.

By the end of the month, commence the pruning of plantations of two years standing. All com-

peting branches are to be shortened or removed, as circumstances may direct. Be careful to cut all branches close by the bole.

In narrow stripes, or small plantations, the side-branches of trees acquire a greater degree of strength than in more extensive plantations; and on the skirts and outsides of all plantations much more than in the interior: Hence a greater proportion of attention to the pruning of these is required. It will generally be necessary to shorten in such as appear to take too strong a form: In shortening such, it is requisite carefully to seek back for a thriving lateral. If such cannot be got near the bole of the plant, it will answer pretty well to take the present and preceding year's growths away;—thereby the flow of the juices will be checked, and consequently the increase of the bough. The branches, so shortened in, may be allowed to remain, till it fall to their lot, in the progress of pruning, to be removed.

Larches, situated in narrow stripes, and on the outsides of timber plantations, should be deprived of the lowest tier of their branches when they are eight or ten feet high; and every year after a tier of branches ought to be removed. In the interior of plantations, and especially of very large plantations which have been thick planted, and which have thriven well, the undermost tiers of larch trees will be so weakened, that perhaps two or three tiers may be taken off at once, with-

out any injury to the plants. The same may be said of all the firs: Yet none of the branches so to be removed, ought to remain on the tree till they have ceased to grow. Both the larch and fir branches should be cut off while they are alive. If dead branches remain for a year or two upon any tree and afterwards be cut off, the blemishes in the wood, when it comes to be used, will be sensibly greater than if they had been removed in time: And if a dead branch be allowed for a number of years, especially upon the firs, it will form what is known by the name of a *Cork Knot*.

THINNING PLANTATIONS.

The thinning of young Plantations may now be carried on with much propriety; because the side-shoots of such as are left will be better ripened, and so be more strengthened to endure the severity of winter. The above subjects have been largely treated of in *January*; to which we refer the reader.

WOODS AND COPSES.

CONTINUE due attention to the keeping of the trees of last spring-sowing clean of weeds. Those, also, of a year or two longer standing, must be relieved from encumbering herbage.

See that the crops of vegetables among the young Copses be clean of weeds; and that none of the vegetables be overshadowing the young trees.

The pruning of young Copses of two or three years standing, may now be begun. The management for these is the same as for Forest trees of the same age.

The preparation of land for future Copses, as advised in the preceding month, may still be continued.

FENCES.

MANAGEMENT OF EVERGREEN SCREEN HEDGES.

Such Evergreen Screen Hedges as are allowed to grow more negligently, should now be disbur-

thened of their superfluous side shoots. In performing this operation, it is necessary to cut, so as to have the amputated part covered among the leaves from the range of the eye. Hedges of Holly, kept in the above loose manner, have a far more rural appearance than when dressed with the shears: Besides, they will produce a profusion of berries to attract singing birds, and to please the eye by their beautiful variegated appearance during winter; while such as are dressed with the shears exhibit a formal shape, and unvaried green surface, in the cheerless season of the year.

Screen Hedges of Laurel should be treated as above advised for Screen Hedges of Holly. The Laurel is unfit for any situation requiring the shears.

MANAGEMENT OF FENCES AND DIVISION HEDGES.

Holly Hedges, which are planted either for Division Hedges or Fences, together with Yew and Privet Division Hedges, are now to be dressed by the shears or the switching bill. The wedge form is the best for all such hedges. Square-topt hedges generally become bare at bottom for want of air; while those of the above form will continue green, from the bottom upwards, ever so long. Division Hedges of the Tree-box are by far prettiest, when kept as above recommended for the Fir, Holly, and Laurel Screen Hedges. The

height of these hedges must be regulated by the purposes to which they are applied.

PLANTING EVERGREEN HEDGES.

The end of this month is a good time for planting out hedges of the above kinds. In all cases, when lifting such Evergreen plants at this season, the ground should be well prepared, and rich.

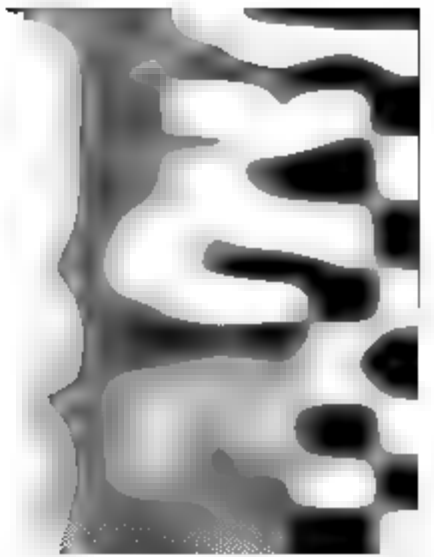
CLEANING HEDGES.

The work of Cleaning young Hedges is still to be attended to. Very generally, by this time of the season, old hedges become beset with thistles, docks, hemlock, and other large weeds. When such are allowed to remain, they not only rot the hedge, but render it bare and naked at the places where they grow, and also spread their seeds in the adjoining fields. They must therefore be carefully removed at this time; and the hedges will continue, in this respect, comparatively clean during the season.

MAKING FENCES.

Sunk Fences, Sunk-Fence Walls, together with walls of all sorts, are still to be carried on. Turf walls and top dikes may also be constructed. It may be proper again to notice, that top dikes

should not be erected till a year after the earth has been thrown from the ditches, and had time to get compact ; otherwise the ground will be apt to sink unequally, and thus occasion the downfall of the dike.



AUGUST.

August.

THE NURSERY.**CLEANING.**

CONTINUE, with earnest care, to keep the Nursery ground, in every place, clean of weeds ; carrying them off to the rot-heap, as directed last month.

PRUNING.

Go on with the Pruning of young trees in the Nursery lines ; never forgetting to cut the branches close by the bole.

LAYING EVERGREENS.

By the end of this month, it is proper to lift and lay all kinds of evergreens, if the weather be moist ; otherwise, it may be deferred till rain or damp weather come. The method of laying

has been treated of in *February*; which see, (page 283.)

It has been advised in *April* (page 336) not to take up more Firs or Evergreen trees from the seed-bed than can be planted the same day. This precaution is still more necessary now, than at that season. Be careful not to shake the plants when they are lifted; as, the more of the natural soil they have along with them from the seed-bed, the better will they thrive in the places where they are planted out.

Two-year seedling Hollies may now be planted out in beds, as advised in *April*. Be cautious, in lifting them, not to break a fibre of their roots; and let these be as short time exposed to the air as possible. Be careful, likewise, not to shake the earth from their roots; but have them laid with as much of the seed-bed soil adhering to them as possible.

All Evergreens which have been raised by cuttings, as Laurels, Yews, Privets, and the like, should now be lifted and replanted; as directed in *April*. Such of these as have been raised from seeds, should be treated as above advised for seedling Hollies.

EVERGREEN CUTTINGS.

The end of this month is a proper time for making cuttings of Laurels, Yews, Privets, and simi-

lar plants. The best cuttings are the present year's shoots, with about an inch of the last year's wood adhering to them. The leaves should be carefully cut off by the knife to within three inches of their tops. The cuttings should be nine inches long, and should be laid in to within three inches of their tops, and placed perpendicularly. The soil most proper for them is such as is light, very rich, and a little moist, but not wet: the best situation is on a shady border, which receives the morning sun only. The land will be much the better for being well manured, and for having been under a crop of turnip or the like the preceding summer. It should also have been dug and kept clean during summer till now.

GRUBS.

By this time of the season, it not unfrequently happens, that the one-year Larch, as well as other sorts of one-year seedling trees, are sadly infested with *cutworms* or grubs. Their presence will be known, by numbers of the young plants being cut over at the surface, and falling down. In every spot where plants are thus cut over, the ground is to be examined for a little way round about, and perhaps half an inch deep, where the destroyers will generally be found. They should be gathered and destroyed, else many thousands of young trees will be lost. Crows are very serviceable in

picking up grubs, and are generally numerous at this season of the year, where these abound.

ORNAMENTAL PLANTATIONS.

THIS is a period of the season when weeds get very rapidly into a seed-bearing state. It will therefore be useful to examine all ornamental plantations, both those which have, and those which have not, been cropped with green crops. Pull and carry off all seeding weeds. This labour will be richly rewarded, by diminishing the number of weeds in the succeeding seasons.

Continue the pruning of plantations, and of single trees, wherever necessary.

Go on with the planting out of all Evergreens; as Holly, Laurel, Laurustinus, Arbutus, Rhododendron, and the like. See that these be lifted with care, and have proper soils to set them a-going.

Wherever there is occasion to plant Firs in pits or in fallow ground, it may now be done. Be careful to plant in damp weather; and see that no earth be shaken from their roots.

Continue the preparation of grounds for future plantations, as advised in the preceding months.

FOREST PLANTATIONS.

CONTINUE the preparing of grounds for future plantations, according to circumstances, as directed in the preceding months ; which see.

PLANTING FIRS.

In such plantations as have been prepared by pitting or fallow, and in which it is intended to plant Firs, the work of planting may now go on. Be careful to choose damp or rainy weather in which to perform this operation ; and see that no more plants be taken up in a morning than can be planted on the same day. The prospect of success depends much, at any time, on the fresh, undried state of the roots of the plants ; but more especially at this warm season. In cases, therefore, where the plants must be brought from a great distance, it is wrong to attempt lifting them at all at this season ; for, although the plants will do well if planted immediately from the Nursery, they are liable to many injuries from delay and long carriage, and seldom succeed when exposed to these disadvantages.

We would carefully guard our readers against attempting, at this season, the planting out of Firs in grass land, either by the T method, or by the triangular dibble. We have known some eager and hurried planters greatly disappointed in the attempt. Such work should always be left till the latter end of March or first of April. Indeed, every attempt to plant by such means, at this season of the year, must fail, because there is not sufficient length of time before winter for the roots to strike into the hard, unmeliorated sides of the slit; neither do the roots of the grass pass from the one side of the cut to the other, in sufficient numbers to keep it from opening; consequently the first severe frost generally turns out the plant.

PRUNING AND THINNING.

Continue the pruning of all plantations, as directed in the preceding months. It is now a proper season for commencing the pruning of Gean trees in the forest. See *February* and *January* under this article. The thinning of young plantations of all kinds may now go on.

RELIEVING LAST SPRING PLANTED TREES.

At this season all the spring planted trees in every part of the forest are to be examined. Many

of them will be found very much overridden by brambles, whins, or coarse grasses. These are therefore, carefully to be cut over, by a well sharpened spade, all around the inside of the pit. It is not requisite, in this case, to lift the weeds or haulm off the pit; only in case of the young tree being bent over, it must be relieved; otherwise, the haulm may lie upon the pit around the tree. Spring-sown Oaks will hardly require any attention at this time; however, as you go through to relieve the nurses, any oak pit which has been neglected may also be relieved as above advised for the others.

WOODS AND COPSES.

THE same operations which were recommended last month, are in all their branches to be continued in this.

It is now time to begin the pruning of young saplings and wavers on the stools in Copses. The manner of pruning these is the same as for forest plantations of equal sizes and ages. The principal point, in the present case, will be the reducing all shoots which compete with the leader, to due subjection, and leaving the stem of the leader clothed with small twigs.

Mixed Copses, which were sown last spring, together with those which are one year older, should be carefully examined, and cleaned of weeds, hoeing as near the patches as possible. Care must be taken that none of the crops which are sown or planted among them be encroaching so as to injure the young trees.

FENCES.

ALL young hedges, together with those which were cut and plashed last winter, must be cleaned of weeds this month. By being cleaned at this season, they will be left in a proper state for the winter dressing.

Continue the dressing of evergreen hedges, as advised last month.

Switch and clip thorn and other deciduous hedges. Under this article for last month, when speaking of evergreen hedges, it was noticed, that square-topped hedges are always necessarily bare at bottom. Let thorn and other deciduous hedges, therefore, be gradually moulded into the wedge shape, tapering from bottom to top on both sides equally, till they meet in a point at the top. Two feet at bottom is a sufficient breadth for a five feet hedge: a greater or a less height should have the bottom wider or narrower accordingly.

In dressing young hedges, either of the deciduous or evergreen kinds, the sides only should be cut till the hedge arrive at the proposed height, unless it be necessary, for the sake of shelter, to cut their tops over, in order to make the hedge thicker of branches. Such cutting of the upright shoots, however, is not of any very great use in this respect ; because every hawthorn hedge sends out a number of side shoots, which, if encouraged, by keeping the top narrow as above, will make it abundantly thick.

. Continue making of stone the fences, of every description, as advised in the preceding months.

SEPTEMBER.

ff,

September.

THE NURSERY.

THE work of cleaning nursery grounds of weeds, of planting out young Firs and other Evergreens, and preparing and laying cuttings, as recommended in last month, is still to be carried on. But it may here be mentioned, that the operations of laying Evergreens, or of making cuttings and planting them, cannot, with propriety, be performed after this month.

SOWING SEEDS.

This is now the most proper season for sowing all sorts of seeds which are in the rot-heap. We have pointed out the methods of sowing the various kinds in *February* under this article, to which we refer the reader (p. 240, &c.) Many people sow their Elm-seed at this season. We have already stated our reasons for deferring this work till April. Indeed, if there have been any gather-

ed and sown, as directed in the early part of *June*, these will be sufficient to hazard for early rising elms; for a hazard it certainly is, inasmuch as, if once they be frost-bit, though they be not killed, they never make so vigorous seedlings.

Birch seeds may also be sown at this time with propriety. We have known autumn-sown Birch seeds rise much closer than those sown in spring. Sometimes, however, the autumn sowing, vegetating early, suffers by the frost in spring.

GATHERING BIRCH SEED.

In the first of this month the Birch seed will require to be gathered. It is to be got in perfection wherever Birch trees grow. It occurs in small pendulous cones, which are easily shaken, when ripe, even by light winds; so that, by the end of this month, it has generally all disappeared, or at least the best and first ripened has been shed. It is therefore necessary to embrace the earliest opportunity of collecting it after it is ripe. The ripeness is easily ascertained by the looseness of texture of the cones. When ripe, they will part into pieces in the hand, in the act of pulling.

There are two varieties of the Birch, which we have noticed in page 80. The weeping sort is easily distinguished from the common, both by

the stature of the tree, and by its pendulous branches. The Common Birch never grows to the size of the Weeping. Its branches are more straight and upright, and its leaves are smaller.

The Weeping Birch will arrive at the stature of a timber tree in much less time than the other, and is far more handsome in youth, and indeed at any time, than the common. It is therefore of great importance to gather all your seeds of the Weeping kind.

If it is intended to sow these seeds in autumn, they should be sown as soon as gathered from the trees, and before they become dry.

If Birch seeds are to be sown when gathered, it is a matter of little moment whether the cones be in a dry state when gathered or not. But if the seed be intended for spring sowing, the cones must be gathered when in a dry state; and every day's gathering should be carried to a dry loft floor, and spread thin; for if a large quantity of cones be put together when new gathered, they will soon grow hot, and so be destroyed.

GATHERING SYCAMORE SEEDS.

The seeds, or keys, grow abundantly on almost every large Sycamore tree. They hang in bunches of considerable size, and so are easily procured. They will be in a proper state for being gathered by the middle or end of this month.

This work should not be delayed too long, because the seeds soon begin to drop, and, at any rate, are very apt to be shaken by the strong winds of September.

The seeds of the Sycamore should be carried to a well-aired dry loft floor, and there be frequently turned over, to prepare them for being kept till spring, when they are to be sown.

GATHERING GEAN SEEDS.

Geans will, by the first of this month, be fit to be gathered for seed. The common small black, or red sorts are the best for timber trees. These are to be had very generally over the country. There are also considerable quantities of them brought from England; but, unless you can depend that the person sending them will send none but the small Black or Red Gean, none of those so received should be sown for timber trees. Cherry stones are not proper for this purpose; but, as they abound in England, they are too often substituted for, or mixed with the other; so that it is very difficult to procure Gean seeds unmixed from thence.

Geans should be sown immediately from the tree, if possible; because they give a good crop in the following season. But if they are kept unsown till January or February, many of them will not rise till the second spring. When Gean

stones are reserved for spring sowing, they should be kept in sand, and not in a very dry state.

ORNAMENTAL PLANTATIONS.

PRUNING ORNAMENTAL PLANTATIONS.

CONTINUE the pruning of Ornamental Plantations. Indeed, it would be much for their advantage, if the pruning were all over by the end of this month: Because the wounds, in that case, will be greatly healed, before they have to encounter the severities of the winter.

THINNING NEGLECTED GROVES.

Thin out neglected groves of all kinds, and prune the remaining trees. This subject will be found treated of under *Forest Plantations* for this month; to which we refer the reader, (page 444.)

PRUNING DETACHED ORNAMENTAL TREES.

All detached hedge-row and ornamental trees ought now to be pruned wherever required. These

ought, however, to be touched only with a sparing hand, especially Ornamental trees in the park or the lawn. It should be kept in mind, that here the principal object is not timber, but beauty ; and nothing can be farther removed from this, than various sorts of trees forced into the same general outline by mere dint of pruning. Indeed, every ornamental tree should appear as if formed by nature : the mark of a tool should never, if possible, be seen upon it.

The Ash should be allowed to express his own natural stability, by his Tuscan trunk, supporting his lofty and far-extended limbs ; a wing of which might probably cover a small group of Hazel, entwined with Bramble.

The Oak, the king of trees, should be guided to the greatest possible height, that, in the majesty of his stature, he may look down on his less important neighbours ; perhaps covering in his shade a group of common Hawthorn or Holly.

The Sycamore and the Lime should express their natures by the multiplicity of their sociable branches and leaves, supported by their massy trunks, in their quiet retreat near the gentle murmur of the rivulet, whose waters scarcely cover the pebbles among which they creep along ; allowing to be heard the grateful hummings of the laborious bees, offered up while they sip the honey from the rich flowers of these trees ; while the bleating sheep and lowing cattle beneath, express

their gratitude for the shelter afforded from the summer sun.

The Larch and the Silver Fir should each be clothed with laterals from top to bottom. Not one of these should ever feel the knife.

RECLAIMING NEGLECTED HEDGE-ROW TREES.

Hedge-row trees which have been neglected or ill treated, may be reclaimed in a great measure after a few years necessary attention to reduce the plants into form by degrees. Trees, however, of this description are often found so bent, squab, and bushy, if much exposed, that it would be next to impossible to shape them for tall timber. As to these, if, in kind, they come under the description of *SHIP TIMBER*, it is obvious what course to take in order to turn them to profit; they ought immediately to be cut down. Others, which are found inclining upwards, although in disorder in respect of pruning, in time may be induced to shoot tall and straight.

It has been observed, that Hedge-row trees should be of some considerable length of stem. This object, however, can only be attained with certainty by good management, from youth upwards; for it would be highly imprudent to attempt to produce a long stem on many grown trees: these often having a great number of very large side branches.

ON THE TREATMENT OF WOUNDS, BRUISES,
AND OTHER CASUALTIES.

The present subject naturally follows the reclaiming of neglected hedge-row trees. Among these, as well as in the park and in the lawn, and also in neglected old plantations, it is often necessary to inflict larger wounds than we could wish; and, not unfrequently, accidental wounds, bruises and fractures, solicit our attention.

Daily experience tells us that the wood of a tree exposed to the action of the air, by being deprived of its bark, is subject to corruption; and by observation we learn, that the timber exposed, by the amputation of a large limb or branch of a tree, is more liable to corruption in a given time, than the same extent of surface exposed on the bole of the tree. But, at all events, if portions of the tree, in either situation, be exposed to the continued action of the air, they will ultimately become rotten wood; and this gangrene might, in many cases, spread its effects over the whole plant, and occasion its death.

By a wise provision of nature, every injured tree exerts itself to cover over such exposed places with bark, to prevent its ultimate destruction. Hence, when branches have been carelessly cut off, leaving several inches sticking out, these knags by and bye are covered over so, that the bole for

many years after, shews an uneven exterior. She even expresses her anxiety to cover over stumps of a still greater length, by surrounding them to a considerable height, with annual layers, till they, by long exposure, become entirely rotten, and drop off, leaving holes for the admission of accidental rains, or even nestling birds; yet undiscouraged, she continues her efforts in subsequent seasons, till they are completely closed up. In the blind effort, however, the tree not unfrequently carries in its bosom the cause of its destruction: It is astonishing what extraneous substances a tree will entomb*. It appears, therefore, from these circumstances, that it is proper and rational to assist nature in these efforts. If the amputation be large, or if the bruise be extensive, some substance should be applied in lieu of the removed bark, to prevent the action of the elements on the timber, till nature supply the deficiency.

* An Elm tree, which grew at Wemyss Castle, two feet in diameter at the middle, with a bole of 30 feet in length, and without the smallest appearance of blemish upon the exterior, was sold to Mr. James Allan, wright in Kirkcaldy, in 1808; and when brought thither, Captain Black, ship-owner, bought it for cross-beams to one of his ships. When the sawers (James Annan and John Fletcher, both living in Kirkcaldy at this time, 1811) were running the first draught up the tree for the above purpose, they came upon a number of *whinstones*, *pieces of red tiles*, and a quantity of earth, fully 56 lb. weight, and this at the height of 14 feet from the root!

That substance which will best preserve the wood from corruption, is the fittest to be applied, whatever it may be ; and there is none better, that we know of, than *coal tar*. Previous to its application, the wound should be smoothed with the plane or the knife, and wiped dry with a woollen cloth.

In case the wood, at a bruised or amputated place, have, by neglect, become already corrupted, the rotten or dead wood is to be pared out quite in to the quick ; and the wound is then to be dressed as above : and there is no fear but nature will soon afford a more durable and proper plaster. A wound, hollowed out as above, may at first appear an unsightly blemish ; but, in subsequent years, nature will lay the coats of wood, under the new formed bark, thicker at that place ; and probably may in time fill it up to be even with the general surface of the tree.

All fractures, by whatever means produced, are to be managed as the circumstances of the case require. If a large branch be broken over at the middle of its length, it should be sawn clear off close by the lateral which is nearest to the bole of the tree : But if there is no lateral, or branch, capable to carry forward the growth, cut the main or fractured branch in quite to the bole. In both cases, treat the wounds as above recommended.

In small wounds, however, there is not, in our judgment, occasion for any application ; such be-

ing only required to prevent rotting on large wounds, which are necessarily long exposed to the air before the bark cover them over.

Interior rotting, arising from the dampness of the soil, cannot by the art of man be cured. It might have been prevented by timeous draining. But the hearts of trees frequently rot, where there is no excess of moisture. See the case of the larches stated in note, page 58. Many Ash, Elm and Plane trees felled in Arniston Den, some nine years ago, were found quite hollow, though they grew on dry land. One circumstance regarding these is worthy of recording; and that is, they were produced from old roots left in the ground by a previous felling.

Such roots, when in good ground, send up very great shoots with few leaves in proportion to their sizes; by the absence of a profusion of these, properly to concoct the juices so abundantly supplied by the roots, the fibre of the wood is loose and imperfect; the next season will supply more leaves in proportion to the supply of juices, yet not a sufficient number for making perfect timber; several years may pass before this event arrive: Thus crude and ill digested timber disposed to premature decay, is the foundation over which subsequent coatings of wood are laid: Yet, however perfect these may be, they do not prevent the progress of decomposition going on in the interior. Nature teaches how necessary many leaves are to the proportion of the solid wood, the cotyledons and subsequent

leaves of a one-year old tree, are a thousand times greater, compared to its solid contents, than are the leaves to the solid contents of the first year's shoots from roots like the above.

Shakes often arise from the weight and multiplicity of top branches, and might have been prevented by timeous pruning. Shakes or rents in the boles of trees, however, often happen where there is no excess of tops. Sometimes the rain running down from the branches, wets one part of the bole, while the rest is comparatively dry. If this circumstance is succeeded by an intense frost, before the wetted side become dry, the bole may be rent for a great length, and perhaps to the depth of the core. Shakes or rents like the above, are difficult to cure. The best method of helping them, is to trace out their upper extremity, caulk it up with oakum, and pitch it over, to prevent the rain descending that way in future.

PREPARING GROUNDS.

The work of preparing for future plantations may go on as directed in the two preceding months.

CLEANING, &c.

This is one of the works which, during the summer and autumn months, is never to be lost

sight of. Upon attention to it, depends the greater part of the success of Copses. See, therefore, that all copses, which have been lately sown, be made as clean as their situation will admit of. It will be proper to go over all copses sown in pits among grass lands, and to relieve them further from encroaching weeds. Such as have been sown in like situations several years ago, are to be attended to, as directed for *Forest Plantations* last month, under the article *Relieving new planted trees*; which see.

FOREST PLANTATIONS.

FALLOW.

By the end of this month, all grounds in a state of preparation by fallow should be laid up in proper ridges, as elsewhere noticed. If this business be deferred till a later period, the weather may become damp and rainy, so that it cannot be so well done; and perhaps the weather may be so far broken, as not to allow it to be further touched till spring: In which case, the ground would be soured, and very much injured.

To prevent a misfortune of this kind, a plantation which has become close and crowded, having been neglected from the time of planting till perhaps its twentieth year, should have only some of the smallest and most unsightly plants removed ; one perhaps in every six or eight, in the first season ; in the following season, a like number may be removed ; and, in two or three years after, it should be gone over again ; and so on, till it be sufficiently thinned. It will be proper to commence the thinning, as above, at the interior of the plantation, leaving the skirts thicker till the last. Indeed, the thinning of the skirts of such a plantation should be protracted to a great length of time.

PRUNING SUCH PLANTATION.

If the thinned plantation under view consist of Firs or Larches, all the rotten stumps, decayed branches, and the like, must be cut off close by the bole. It will be needful, however, to be cautious not to inflict too many wounds upon the tree in one season ;—the removing of these, there-

estate, we found these rows so left with hardly a single tree remaining alive, and some of the poor trees literally without the skin ! While, on the opposite side of the house, in the same quality of soil, trees were standing single, growing, and vigorously growing, at 60 or 70 feet high : These last, however, had stood single from their infancy.

fore, should be the work of two or of three years, rather than endanger the health of the plantation.

After the removal of these from the boles of the firs and larches, proceed every two or three years, but with a sparing hand, to displace one or perhaps two tiers of the lowermost *live* branches, as circumstances may direct; being careful to cut close by the trunk, as above noticed.

In a plantation of hard wood, under the above circumstances, the trees left for the ultimate crop are not to be pruned so much at first as might otherwise be required; Only one or two of their competing branches are to be taken away; and even these with caution. If it be judged too much for the first operation to remove them entirely, they may be shortened, to prevent the progress of the competition; and the remaining parts may be removed in the following season; at which time, as often observed, they must be cut close by the bole.

**RECLAIMING NEGLECTED PLANTATIONS FROM
TWENTY TO FORTY YEARS OF AGE.**

Plantations of the above age, which have never been thinned, and which have grown well and are now become thickets, may still be reclaimed, although not without considerable difficulty. In this case, the trees will be very tall and slender,

and must, with the utmost caution, be exposed to a freer air than they have lately enjoyed, nor will it be possible to reduce the plantation into proper order at the first, or perhaps the second thinning.

In the present case, it is probable that many of the trees have gained an ascendancy over the rest. These, unless they are of bad kinds, should be regarded as the future crop, and be managed accordingly. Indeed, such as have been overtopped in a perfect thicket for years, will be rendered so feeble, and have so few side-branches, that they would neither be able to support their own weight, were they left single; nor would it be possible to reduce them into proper shape. Though such, therefore, are of better sorts, they must be considered as subjects to be removed.

The first operation necessary in the present case, is to go over the whole plantation or forest, and mark, by a daub of white paint, or some such contrivance, the trees intended as the principals, or future crop. After having determined on these, cut out such a number of the others as the circumstances of the case will admit; being careful rather to thin too little than too much. Such as are removed should be cut a few inches below the surface. Return and prune the principals, sparingly lopping off as few branches by the bole as possible for the present: Shorten the competing branches down to a fresh lateral, being careful

not to reduce the top too much ; nor, indeed, any farther for this time, than to give the leader the ascendancy.

In the second or third season following, it will be proper to go over the plantation again ; thinning out a further part of such as were left as temporaries, and pruning the principals farther into shape ; being careful to remove as many of the partly amputated, contending leaders, close by the stem, as the case will allow.

In two or three more years, it may, with proper attention, be possible to reduce the plantation into order, without farther danger from the wind. At this age, namely, about thirty years, the trees may be thinned out from ten to fifteen feet, more or less, according to the richness of the soil, situation in point of shelter, and vigour of the plants.

About seven years afterwards the trees will have advanced apace, from the treatment they have experienced ; and may now be finally singled out to the distance of about thirty feet each way, more or less, according to circumstances, as noticed above. At this time also, let the necessary pruning be performed, by sending a light person up to single out the leaders more perfectly ; the keeping of which in order will henceforth be the principal care required.

RECLAIMING NEGLECTED PLANTATIONS OF FROM
FIFTY TO SIXTY YEARS OLD.

Plantations of this age, which have either never been regularly thinned, or which have run into disorder, are most difficult to reclaim. In this case the branches have assumed the appearance of large arms, and bear a considerable proportion to the trunk : To lop off such at once would be very imprudent, and to shorten them would make the trees unsightly.

A temporary unsightliness, however, should never induce us to abandon what is evidently for the good of the plant ; nor tempt us to hazard its health for the sake of neatness. If laterals can be found on such a limb, conveniently situated, whereat to shorten it, with the view of aiding or forwarding the upright growth of the tree, and the bulk of the trunk, it certainly should be done.

However, if the tree be divided into two large limbs, issuing from a short trunk, to which the limbs bear a very considerable proportion, (which is no uncommon case), it would be the height of absurdity to lop off or shorten the one, with the view of forming the other into a proper bole. On small trees this may be performed perhaps with propriety ; but on trees as thick, or twice as thick as a man's body, the wounding of great

limbs, equal in thickness perhaps to one's thigh, becomes a matter of hazard.

It were better, in the process of thinning, entirely to take out plants of this description; provided, that by so doing, too great blanks be not formed; and that there be neighbouring trees of value, with better formed stems, to fill the ground.

In thinning plantations of this description, particular care should be had to prevent the injury arising from boisterous winds, by keeping the margins, and all points which are much exposed, considerably thicker than the interior or sheltered parts. If the plantation be much overgrown, very close, and stand elevated, it may be found proper to set aside and prune up some temporary trees, perhaps baring them of branches on one side entirely, in order to give place to plants deemed worthy of standing for good, and the safety of which, by removing the former at once, might be endangered.

At a revision, in a few years, such pruned-up temporary trees, and others of little value, which can be spared, should be removed; thinning out the whole, as regularly as possible, to the distance of from thirty to forty feet, according to circumstances, as already advised.

In plantations of this age, and, indeed, in all close woods, it would be imprudent to stub up by the roots the trees which are thinned out; because,

in doing so, the roots of those left standing, might be seriously injured. They will, long ere this, have extended their roots over the whole surface : Many of the fibrous extremities will be intermixed with the roots of the plants to be cut ; and these extremities being broken or wounded in the operation of stubbing, would prove of considerable detriment to the growing trees, since, from such extreme fibres, which may be deemed the purveyors of the plant, its chief sustenance is derived.

In thinning such plantations, it is a matter of very considerable importance, to be careful not to hurt the principals, by the fall of those to be taken out. With this view, it may frequently be proper previously to saw off the larger boughs of such plants as are to be removed, lest, in their fall, they might become entangled with the branches of those that are to stand, which they would not fail to injure.

A block and tackle may frequently be found serviceable to aid the endeavour of laying the tree in a particular position, and keeping it clear, in the fall, of the branches, or stems of others : Although a practised and skilful feller, provided the tree in question be pretty straight, and stand fair on its foot, can almost, to a certainty, lay the head where he wishes ; yet, if the stem be crooked, and the plant grow in an oblique posture, it will frequently take very unexpected turns in its fall.

Plantations of Scots Fir sustain less injury by being kept too thick, especially in youth, than any

other kind of trees. Indeed, to produce tall, straight timber, it is necessary to keep all young plantations of Scots fir rather thick than otherwise. Therefore, such as have been planted at about three or four feet apart, and which have risen well, and are under ten years of age, should not be deemed neglected, even though they have been neither pruned nor thinned, provided only their leaders have been kept single.

But such as have been left in this state, from this age onwards to twenty years, without being both pruned and thinned, certainly deserve to be termed neglected; because they will have numberless *dead* branches, or rather stumps, left sticking in their boles; which afterwards make lamentable blemishes in the timber; and many of the trees will be so small and enfeebled, by the want of air, that they will prove good for nothing. Such plantations, therefore, as are already twenty years of age, and have not been thinned, are certainly in a state which requires immediate attention. At this age, they may be thinned out the first year, after commencing the work, to five feet distance; and they must, in the next, be revised, being particularly careful not to expose them too much at once; and, within the next ten years, they may be occasionally thinned out, till they stand from nine to twelve feet apart, according to the vigour of the plants, the quality of the soil, and the exposed or sheltered nature of the situa-

tion. But, during this time, an annual attention to prune off such laterals as are unnecessary, is indispensable.

Plantations of thirty or forty years of age, which have been suffered to run into disorder, must be treated with still more caution in thinning. Their forlorn condition has been the consequence of many years neglect; and they must not be expected to be suddenly reclaimed. In the first year, remove only the small overridden plants: The second year go a little nearer: Mark such as you judge the best for the crop; and prune off the dead stumps. In the third year, you may thin them out to six feet apart, and, by the fifth year, they may be thinned out to nine feet apart. The next thinning, within ten years, may be to eighteen or twenty feet apart, provided it happen at intervals of five years; and a third revision at twenty years distance from the last, should determine the final distance; which should be from thirty to forty feet, according to circumstances. It may be unnecessary to repeat, that such plants as have lost their leaders are the first objects for removal, provided no considerable blank be thereby occasioned.

What is above said respecting the Scots Fir, will equally apply to the Spruce, the Larch, and all others of the Fir tribe, which are planted for timber trees.

WOODS AND COPSES.

LET all new-sown Coppice Woods be examined, and the patches carefully cleaned of weeds ; and let such as have been sown in pits be relieved from all encroaching brushwood. If these operations be well performed at this time, the young plants will require no more attention till spring.

Continue the preparing of soil for future Copses, as formerly directed.

Go on with the work of pruning wavers, as advised last month. It need hardly be noticed, that the only instrument proper to be used in this sort of pruning is the knife ; and that the wounds should be made quite clean.

FENCES.

THIS is now a fit time for preparing all young Hedges for winter, by cleaning them of weeds. Recollect how disagreeable it must be for the hedger to stand in the ditches in the winter months, probably among water ; and how little work is done under these circumstances, and that little very im-

perfectly : Therefore, let all hedges be now cleaned, and, if possible, all deciduous hedges switched. If they are switched at this time, the wounds will be healed before the winter set in.

The building of stone walls with mortar should all be finished by the end of this month : Such as are built with mortar, after that time, seldom make durable walls ; because the rain keeps them damp till the frost comes on ; which, again, from their damp state, takes severe hold of them, and so dissolves any adhesion that was formed between the parts.

Drystone and Galloway dikes are not, of course, subject to the above injuries by frost ;—they may, therefore, be carried on during the autumn and winter months ; unless on account of the state of the roads, which is frequently bad ; the by-roads in particular being often impassable.

In all cases, the planting of Evergreen Hedges must be completed by the end of this month. If it cannot be done by that time, it will be better to defer the work till April.

OCTOBER.

October.

THE NURSERY.

SEE that all the ground be made quite clean of weeds. If it is not cleaned up by the end of this month, it will probably continue in a very bad state all the winter, or it must be cleaned at a great additional expense of labour.

If the sowing of rotted seeds, as Haws, Ash-keys, Holly-berries, Roans and Yew-berries, be not finished, it should not be delayed. The soils proper for these, and the manner of performing the operation of sowing, have been treated of in *February* (pp. 240—248); which see.

This is a month highly important to the Nurseryman; because in it, he has many of his seeds to collect and secure; and his future success depends, in a great measure, on the right performance of these duties. We would here repeat an observation which we have made already, namely, the propriety of gathering all seeds from the handsomest and best thriving trees of the kinds,

which can be found ; rejecting the seeds of all ill-formed trees, and such as have any disorder about them ; always remembering, that plants may be expected, in a greater or less degree, to inherit the good qualities or the defects, of their progenitors.

GATHERING ASH-KEYS.

By this time the seeds of Ash must be secured. They are to be got, in great abundance and perfection, wherever large trees of this kind are to be met with. The flowers of the Ash are generally hermaphrodite ; but some trees produce not only hermaphrodite flowers, but also numerous female flowers ; and other trees produce none but these last. The prolific trees are easily distinguished, at this season, by the profusion of bunches of keys which they every where exhibit.

When a sufficient quantity of Ash-seeds has been procured, they are to be carried to the rot-heap, and to be mixed with light sandy earth, and laid in a heap of a flat form, not more than ten inches thick. This we advise to prevent them from heating. We have several times known a crop of Ash trees to have been lost, owing entirely to the heating of the seeds ; and we are persuaded that there is no evil to which the Nurseryman more owes the failure of several of his crops, than to carelessness in guarding against

heating. The Ash-seeds, it may be mentioned, must be turned over several times during their stay in the rot-heap.

GATHERING MOUNTAIN-ASH BERRIES.

This should be done in the first of the month; because, by the end of it, the roans are frequently swept from the trees by the birds. These berries are very easily procured, and are both good and plentiful wherever Quicken trees grow. As soon as they are gathered, they should be carried to the rot-pit, mixed with light sandy earth, and laid ten inches thick in a flat form, and covered two inches thick with the same kind of soil; in which state they may remain till the following autumn, for sowing.

GATHERING ALDER SEED.

This is now fit for being gathered. It is found very plentifully on almost every tree of the kind. It grows in small cones, somewhat resembling the Birch, but hard, and rather woody.

By choosing dry weather for gathering the cones, you will have much less trouble in drying them, and be surer of undamaged seeds. As soon as you have gathered the cones, they are to be carried to a loft floor, and spread out thin. They are afterwards to be frequently turned, and the seeds

will fall out in the act of turning. They are much more ready to drop out, if the loft happen to be placed above an apartment where a good fire is kept. When all the seeds which will readily come out by the above plan, have escaped, and are lying on the floor, gather them up into a bag for spring sowing. The cones are then to be thrashed and sifted, as advised for Fir cones. Alder seeds may, like those of Birch, be sown from the tree; but, like the Birch, the germinating Alders are liable to be destroyed by early frosts in the spring.

GATHERING BEECH-MAST.

Beech-mast is now ripe, and must be gathered without delay. It is found in abundance in many places in Scotland; but it is still more plentiful in England, from whence great quantities are brought by the Scots nurserymen every year when it is to be had. The seed very readily drops from the trees when ripe. The capsule opens of its own accord, and allows the seed to fall out. A dry windy day, in the beginning of this month, will some times make the seeds rain down from trees plentifully loaded with masts. When the trees stand in short grass, the most expeditious method of collecting the seed, is by sweeping it together by birch besoms. It ought next to be sifted, and the chips of sticks, leaves, &c. to be picked out

from among it. It is then to be laid in a loft, in a stratum five or six inches thick, and to be turned over once a week till it be perfectly dry; when it may be laid eighteen inches thick, to lie till April, for sowing. Beech seed should never be kept in sacks during the winter.

GATHERING LABURNUM SEED.

Laburnum being one of our hardiest trees, and producing seed very freely, it is an article very easy to be had.

As already stated, there are two varieties of the Laburnum; one of which is called the *Tree*, the broad-leaved, and sometimes the Scots Laburnum; and the other, which is most common, is called the *Shrubby*. The Tree Laburnum is the only one worth propagating for timber. It is easily distinguished from the other, by its shining light-green leaves, which are of a larger size than those of the other; the bark is more glossy, and the buds are larger and bolder than those of the shrubby; the bunches of flowers are also longer; and, lastly, this grows to the size of a large tree, while the other continues a shrub or an under-tree. After all, by the ignorance or inattention of seed-gatherers, the Tree kind is so confounded with the Shrubby, that it is seldom to be got separate. It is therefore of great importance to be particu-

lar in gathering the pods from the real Tree Laburnum, when *timber* trees are wished for ; and, when the Shrubby sort is wanted, the seed should be gathered by itself.

When the Laburnum pods are all collected, they are to be carried to the drying loft ; and, as soon as they are dried, they may be gathered into a bag, and kept till spring ; at which time the seeds are to be beat out of the pods ; and are then to be sown immediately.

GATHERING HOLLY BERRIES.

Holly berries are now fit for being gathered. They are found all over Britain in considerable plenty and perfection. When they are gathered, they are to be carried to the rot-heap, and are to be treated in the same manner as above advised for the roan-berries. Holly-seeds generally require to lie two years in the rot-heap, to secure their speedy germination after being sown. But as part of them may rise the second year, it is better, perhaps, to sow them after one year's rotting. We have often procured parcels of Holly-berries from England, and from distant places in Scotland, and have found them liable to heat, from which they have sustained much injury. When they are brought from a great distance, they should be packed up in small, or long narrow hampers ; and there should not be more than a bushel of berries in each hamper.

GATHERING HORNBEAM SEEDS.

Hornbeam seeds are now ripe. They need scarcely, however, be sought for in the plantations of Scotland; for, although there are many fine trees, cones are seldom or never found upon them in this country. They ripen freely in England.

The seeds readily separate from the nuts or cones, and should be sown as soon after being gathered as possible. Many of the seeds will germinate the first year after sowing, and all of them the second.

GATHERING SPANISH CHESNUTS.

Spanish Chesnuts should be ripe at this time; but we have never found them ripe in Scotland. They are therefore procured from England and from Spain. Those that come from Spain are by far the best. They should, where practicable, be sown immediately from the trees; and, consequently, they should be committed to the ground as soon after their arrival in this country as possible.

GATHERING HORSE CHESNUTS.

Horse Chesnuts ripen in some favoured spots in Scotland, and are fit for being gathered at this

time. But the principal supply of Horse-chesnuts comes from England. They should be treated like the Spanish Chesnut.

We beg leave to observe, that neither Spanish Chesnuts nor Horse-chesnuts should be allowed to remain in the sacks in which they come to Scotland, a day after they arrive; because they are apt to mould; and if they be damp at the time of being packed up, which they often are, they become hot, and so are very liable to be destroyed.

GATHERING ELDER BERRIES.

Elder berries are now ripe, and are to be had in great plenty and perfection, in a great many places in Scotland. These should be sown in beds of light earth immediately when gathered; and they will rise in plenty the following spring. The Elder, however, is propagated so much more quickly by *cuttings*, that it is seldom raised from seeds.

GATHERING YEŴ BERRIES.

These are now ripe. When they are gathered, they are to be carried to the rot-heap, and laid in light sandy earth, to lie till next September, for sowing. They must not be laid so thick as to heat. They are to be got in many places in Scot-

land ; but great quantities are brought from England.

GATHERING HAWTHORN SEEDS.

Haws are now in a proper state for being gathered ; and are to be had in great abundance and perfection, on all hedges and hawthorn trees which are allowed to grow wild. So soon as they are gathered, they are to be carried to the rot-heap, and treated as above recommended for Ash-keys. They should not be kept in sacks for a single day after being gathered ; because they quickly become hot, and are spoiled. When there is occasion to bring Haws from a great distance, they should be treated as above directed for Holly berries.

The English seedsmen generally send what Haws they do send to Scotland, in old sugar hogsheads ; and from so many of them being heaped together, in so close a vessel, they heat so much, that we will venture to say, that not once out of twenty times is there a tolerable crop raised from such Haws. Hence the necessity of putting up Haws in small packages, when they are to be carried any considerable distance.

GATHERING THE SEEDS OF LIMES.

The Lime Tree ripens its seeds in many situations in England ; but the berries are but seldom

produced in Scotland, and they come to maturity only in very well sheltered places, and in favourable seasons. They are ripe at this time ; and are to be sown on a bed of light earth, little exposed to the midday sun ; by which means they will rise the following spring : But if they are kept unsown till the spring, they will not vegetate till a year after. Limes, however, are more commonly raised from *layers* : Although it is not so good a way ; yet, being more speedy and easy, it is generally practised.

GATHERING THE SEEDS OF THE PLATANUS.

Seeds of the Platanus, of both sorts, but especially the occidental, ripen in very warm seasons, in England : They need not be looked for in Scotland, even in the best situations. The seeds of both sorts should be sown as soon as gathered from the trees, in a soil and situation like the Lime, as above ; and they will rise in great numbers in the following spring. The raising of these from seed is more dilatory than by *layers* : Hence the latter method is generally followed. The Occidental, or American, will do pretty well from *cuttings*, if planted out in autumn.

GATHERING ACORNS.

Acorns are now in a proper condition for being gathered. They are to be got in many places in

Scotland; but generally in such small quantities, at any particular place, that we are dependent on England for our principal supply of the article. Acorns always succeed best when sown immediately from the tree.

GATHERING WEYMOUTH PINE, SILVER FIR, AND
BALM OF GILEAD FIR CONES.

If these kinds of Cones are left longer upon the trees, they will be very apt to open, and give out their seeds; and so be lost. They should therefore be forthwith collected, and laid up in a moderately dry corner of a loft, to remain there till spring, when the seeds are to be taken out. It is a proper general rule never to take out any kind of Fir seeds from the Cones, till the time of sowing have arrived.

TAKING OFF THE LAYERS FROM LIME STOOLS,
&c.

This is now the season for taking off the lime and other layers from the Stools. The layers are to be cut off where they enter the ground; being careful to leave all the shoots which have risen from the part bent down, for laying in again if required. The layers are then to be eased up with the spade, and that with the greatest care, to preserve every fibre of the roots; and the unrooted

part is then to be cut off quite in to the new-formed roots, which prepares it for being planted out. These should be planted out in light, rich earth, in lines, at two feet distance, and eight or ten inches apart in the lines..

The Stools should then be prepared for relaying, which is done by cutting off all the superfluous twigs and shoots, and gathering off all chips from among them. The ground is then to receive a good dressing of small and rich dung, in order to insure a good crop of layers in the following season.

Having all things prepared as above, begin to dig at one end of a row of stools ; and when you have digged the most distant side of the stool, as far as you can reach with ease, make a slit with the spade in the new digged ground, opposite the shoot which you intend to lay : Take hold of it towards the stool with one hand, and bring it down to the slit ; then take hold of the point of the shoot with the other hand : Press down with the first, and pull up with the other, in a gentle manner, till you form a *knee* upon the shoot ; yet not so as to crack the bark : Set this *knee* into the slit three or four inches below the surface : Tread in the earth close to the knee of the layer with your foot : Cut off the points of the new-laid shoots, leaving only one bud above the surface. Proceed in the same manner with each shoot, being careful to level up the whole in the

course of digging, in a handsome manner ; and the work is finished.

Such Limes as are best adapted for converting into Stools, are well rooted plants, four or five years old ; and if they are divided into two or three branches at the bottom, so much the better. These are to be planted into a quarter of light, rich mould, a little damp in its nature, at the distance of five feet every way ; and, in February, are to be cut over close by the ground, and they will produce several fine shoots by this time of the year, which are to be laid down as above directed.

These directions, both for laying and for procuring stool plants, will apply generally to all other kinds of trees that are raised by those means.

TAKING OFF LAYERS OF EASTERN AND AMERICAN PLATANUS FROM THE STOOLS.

As above hinted, these sorts are to be treated as directed for the Limes. Be careful not to delay this work beyond this month ; otherwise you will both endanger the health of the rooted layers and the rooting of the shoots to be laid down.

MAKING CUTTINGS.

This is now a proper time for making cuttings of the Alder, and of the *Platanus Occidentalis* :

Both of these should be taken from the young shoots of last season, which are well ripened : The cuttings should be from nine to twelve inches long ; and are to be planted out in a rich, shadowy spot, where they will make good progress in the course of the following season.

DIGGING AND RIDGING VACANT GROUNDS.

These are now works of great importance in the nursery. Every spot which is vacant should either be dug rough, or ridged up. The advantages of such treatment have elsewhere been treated of.

ORNAMENTAL PLANTATIONS.

THE work of thinning Ornamental Plantations and groves is still to be carried on : Likewise the pruning and reclaiming of various trees and plantations, as advised last month.

Continue the preparation of grounds for future Plantations, as recommended in the preceding months. It is now time to take up the potatoes which are among the young plantations. Remove all the haulm, and dig the ground over ; laying

it as rough as possible for the winter. Be careful not to come too near the roots of the trees with the spade, for fear of injuring them.

FELLING TIMBER ABOUT A PLACE.

This is now the proper season for determining upon such trees as are to be felled about the grounds of a place. Those of the kind which lose their leaves sooner, or appear more sickly than their neighbours, or which are worst formed, or less adapted by their figure to produce a desired effect, are the first to be felled. Such as are determined upon, are at this time to be marked with a daub of white paint in a vertical direction. In the event of taking down trees in such situations, it is of importance to cut them as low as possible; so that the roots may be quickly covered over with grass, and no rise may be left in the ground; for this purpose, it will be necessary to dig a little of the earth away around the tree; and when it is cut, it will be proper to skin off the bark of the root all around, to prevent saplings rising up. The most effectual way to prevent saplings, is by taking out the roots with the tree at once; but in situations where there are adjoining trees, it will sometimes be dangerous for the roots of those that are intended to stand; otherwise it should always be done.

FOREST PLANTATIONS.

CARRY on the work of thinning and pruning Forest Plantations, and reclaiming such as have been neglected.

PITTING GROUNDS.

As the time of pitting approaches nearer to the time of planting, so does the necessity of care increase, not to bury such surfaces as may probably remain in an un-reduced state till spring. In all cases of hazard, therefore, see that you pare off, as thin as possible, the sward; which discard; and otherwise treat the soil according to its nature, as recommended in *May*; which see.

FALLOW.

The grounds which have been under preparation by fallow, should forthwith be laid up in proper ridges, to render the surface dry during winter, as recommended last month; which see.

FELLING TIMBER.

This is now a proper time for felling full-grown Timber; such as Ash, Elm, Beech, and the like. Mark such as are to be felled, as advised in the preceding article.

It is seldom that it is either prudent or useful to take up trees in this situation by the roots; because these are of little or no use when taken up; and, in the doing of it, those that remain might be much injured in their roots. It is, therefore, only required to cut them as near the surface as possible by the cross-cut saw.

WOODS AND COPSES.

CONTINUE the work of pruning young Coppice wood and also all wavers left upon the stools, as recommended last and preceding months.

In cases where you have cropped the spaces of your last, or preceding spring-sown patches, with potatoes, they should now be taken up, and the surface be cleaned of all haulm: the ground should then be ploughed up, to lie during the winter. The land among young Coppice patches of one or two years old, should be *gathered* by the plough,

leaving the furrows next to the patches, and within ten inches or a foot of them, on each side, which will leave twenty inches or two feet of solid ground around them : On the two or three last furrows, the plough must be drawn by one horse, otherwise the plants might be trod down.

But after the trees have risen to the height of two feet, ploughing among them must be discontinued altogether ; for even although the furrows next to the patches were made with one horse in the plough, the trees would, in many cases, be barked by the apparatus of the plough. Indeed, after this period, the cropping of the land with green crops should be discontinued altogether, and the ground should be sown down with grass. Supposing the trees have now arrived to the above height, the ground may lie during winter without a furrow, and be gathered toward the trees by the spring furrow for the grass seeds, so as to leave the furrow in the middle of the space. This plan will tend to keep the surface dry for ever after.

FENCES.

CONTINUE the cleaning of hedges of all sorts. Go on with the switching and clipping of all kinds of deciduous hedges, as advised last month.

Commence the plashing and cutting down of old neglected hedges, as recommended in *January*, under this article (p. 213) ; which see.

This is now a proper season to begin the planting of young hedges of deciduous kinds. We have treated of this subject fully in *January* ; and shall therefore refer the reader for further information to that month (p. 205).

Building dikes with mortar must now be discontinued during the winter months. The building of drystone and Galloway dikes may, however, still be continued.

NOVEMBER.

November.

THE NURSERY.

GATHERING SEEDS.

CONTINUE the gathering of haws, holly-berries, yew-berries, ash-keys, alder-cones, and laburnum pods, and let them be treated as directed last month; which see.

You may now commence the gathering of fir cones, such as those of Scots Fir and Spruce, together with Larch. If these are gathered in a damp state, let them be spread thin, and moderately dried, on a loft floor, before being laid together in quantities, for keeping till spring, when the seeds are to be taken out for sowing: take care that they be not laid in large heaps, till they be quite dry.

SOWING SEEDS.

In cases where you have not already accomplished the sowing of haws, ash-keys, holly, yew,

or roan berries, from the rot-heap, it may still be done with propriety, if the state of the ground and the weather will permit. Do not, however, attempt to sow if the land be in a very damp state. It will be found a more safe plan to defer it till February.

LIFTING PLANTS FOR THE PLANTATION.

The operation of lifting deciduous trees for such plantations as are now to be planted, should be performed with great care. In every case, see that you injure or shorten the *tap* roots of young trees as little as possible. Bear in mind that the principal reason why natural sown timber, in soils adapted to its nature, arrives at so great perfection, is because the *first roots* are allowed to remain unimpaired. Therefore, in lifting all young trees, be careful of the *tap* roots as well as of every lateral root. It is more safe to lay the large roots of young plants horizontally in the pits, than to shorten them in.

PRUNING NEW LIFTED PLANTS FOR THE FOREST.

If the directions given in *July* and *August* respecting pruning young plants in the lines have been attended to, little or no pruning will now be required, excepting any neglected branches on the bole, and such of the large roots, as have been wounded in taking up. Wherever they have been bruised or coarsely cut by the spade, they

should be shortened in to the sound parts of the root so hurt.

But wherever the pruning in the lines has been neglected, see that it be done before these are sent to be planted in the forest; and let the pruning be performed with attention to the directions already given (p. 430).

LIFTING SEEDLINGS.

The season is again arrived when you may commence the lifting of deciduous seedlings. Exercise all due care to preserve every root. We have before deprecated the plan of cutting in the roots of young seedling trees. Several kinds of these, as the Oak, the Chesnut, and probably the Beech, may require to have their tap root shortened; but it should be done as sparingly as possible. The Walnut, although pushing a very strong root downwards, should never, if possible, have the tap root shortened; for if it is, the upright direction of the growth will be greatly prevented, and probably the health of the plant much impaired. Seedlings, not immediately planted out, must be *shoughed* with care.

TRENCHING VACANT QUARTERS.

Such quarters as have been severely cropped with trees for some considerable time, and are now

vacant, will require to be trenched. This work should be performed with much care, not to leave any fast or unmoved ground between the trenches, and not to bring up much of the subsoil. It is highly improper to attempt the deepening of the soil at once; subsequent trenchings must be looked forward to, for making the land sufficiently deep.

We have several times seen the bad effects of too deep trenching, especially for raising trees in a nursery; and still more particularly for raising seedlings. Two, or at the most three inches of the subsoil, is all that should be brought up in a season, unless it be evidently of a superior or equal quality with the surface, which is very rarely the case. Even if the upper soil be ten or twelve inches deep, it will be more suitable for raising trees, either seedling or transplanted, than if it were made at once eighteen inches or two feet deep by bringing up the subsoil.

DIGGING AMONG NURSERY PLANTS WHICH ARE
TO STAND IN THE LINES ANOTHER SEASON.

This work may now be commenced. The spades to be used should be very narrow, and deprived, by previous use, of their sharp corners, so that they may not injure the roots of the plants. Let the surface be left as rough or unbroken as the circumstances of the case will allow.

LAYING SEEDLINGS.

You may now commence the laying of seedling thorns in dry ground; or indeed the laying of any one-year or two-year deciduous seedlings. Be careful, however, not to attempt this work in any part of the nursery that is wet; otherwise many of the plants will be thrown out during winter by the frosts; and so may be much hurt, if not quite ruined.

PREPARING HEDGE-ROW AND ORNAMENTAL
DECIDUOUS TREES.

This is now a very proper season for lifting and replanting deciduous trees intended for the above purposes. See observations on this work for the months of *January* and *February* (p. 137 & 238).

ROT-HEAP.

Examine all the seeds lately laid in the rot-heap; have them carefully turned over, and further mixed with dry sandy earth! Lay them neatly up in layers, not thicker than ten inches, to lie till needed; covering them over two inches thick, with the same sort of dry soil.

ORNAMENTAL PLANTATIONS.

If the pruning of ornamental plantations, or single ornamental or hedge-row trees, is not yet performed, it ought not to be longer delayed.

See that such grounds as are intended for planting and which have been under preparation by a crop of oats, be forthwith ploughed over, to lie till spring. It is of much advantage to all such lands to have the stubble and un-reduced turf rotted during the winter, because the soil is much more enriched, than if it were delayed till farther on in the season; neither would the surface be so much meliorated by the winter frosts, if it remained unploughed.

Pitting may also now be carried on; but in very few cases will it be advisable to bury the sward in the pits at this late period of the season. If the sward is at all of a coarse, or even of an adhesive or matted nature, it ought to be pared off and discarded, as formerly advised.

PLANTING GROUNDS, &c.

Such grounds as are of a very dry nature, and which have been prepared for planting in the sum-

mer months, may now be planted. We have often noticed the impropriety of planting at this season, or indeed at any season, when the ground is in a very wet state.

Deciduous single trees, or small groups of trees in dry situations, may now be planted in the park or the lawn. These, as formerly noticed, should be prepared trees from the nursery. In case of planting groups, let them be irregular; circular or square groups, are alike bad representations of nature, which is in the present case the only pattern.

Hedge-row trees may now also be planted. Indeed the situation of such is commonly dry; therefore they may generally be planted in this month. In planting hedge-row trees, variety should be studied as far as is consistent with the nature of the thing. Such kinds as the Sycamore, Ash, Beech, Oak, and others, should be planted here. The kinds to be used should not be planted alternately, but perhaps two of the same sort here; three of the next kind following; and perhaps one of each kind alternately next; and so on, in an irregular manner. The necessity of procuring proper soil for these, and for the trees to be planted in the lawn, where the native soil is bad, has already been dwelt upon at length, under the title *Ornamental Plantations for February*, (p. 262).

TRENCHING GROUNDS.

In the event of preparing for planting by trenching, it is proper that this work should be got forward at this time, in order that the ground may have the benefit of the winter frosts. In the present instance, if the soil be not of a sufficient depth, the subsoil may be thrown up, even although it may be of very inferior quality, till the depth of soil be at least eighteen or twenty inches; because, at planting, the roots of the trees will be nearly touching the former surface earth, and will thus be much encouraged.

FOREST PLANTATIONS.

PLANTING.

In all grounds which have been prepared in summer, and which are of a dry or gravelly nature, planting may now be carried on. In very extensive designs, there cannot fail to be many such pieces; and the planting of such, at this season, will greatly lessen the press of work which would otherwise necessarily come on in the spring.

Anxiety to get forward, however, ought neither to induce to plant land in an improper state, nor to put in kinds which ought to be reserved till a more advanced period of the planting season. The only plants to be introduced now are the principals, and larch nurses. On the whole, spring planting is more safe, especially for inexperienced planters.

PREPARING GROUNDS.

Generally speaking, this work ought to be all over by this time, for reasons already assigned. Yet, circumstances may occur to induce the planting of grounds not previously determined upon. It is now too late to think of preparing grounds, at present in old grass, by the plough, for spring planting. Such, however, as have been under grain the last season, may now receive a furrow, to prepare them for spring planting.

Such grounds as are to be pitted, must be attended to with much care. If the sward be pared off, and buried in the bottom of the pits, especially if of a coarse nature, it will lie unreduced, and will rather prove a loss, than an advantage, in the spring. It will therefore, in general, be better to discard the sward entirely when pitting at this late season. The soil must be managed in other respects according to its nature, as stated at large, in *May*, under this article (p. 381, *et seq.*) ; which see.

PRUNING AND THINNING.

In all cases where the operations of pruning and thinning plantations and forests are not completed, they are still to be carried on, as recommended in the preceding months. Continue the felling of grown timber, as noticed last month.

DIGGING AMONG YOUNG PLANTATIONS.

Such young plantations as have been cropped with vegetables, or which are kept by the hoe without cropping, should at this time be cleaned of all weeds, haulm, and the chips and twigs resulting from pruning; and the ground is afterwards to be digged rough, to lie during the winter. The spades to be used here, should be rounded at the corners; or indeed a tool, in the form of a dung-fork with three prongs, will answer well for saving the young roots of the plants.

WOODS AND COPSES.

CONTINUE the various works recommended under this head last month, as far as they are yet unfinished. Pruning, in particular, may go on.

Examine all your Copse grounds, whether planted or sown; and take care that they be made free from standing water. In like manner, the grounds under preparation must be freed from water. There is no rearing timber to perfection, if the ground be allowed to lie wet.

FENCES.

THE whole works recommended in the preceding month, under this article, are still to be carried forward.

This is perhaps the best season of any for making new fences of deciduous plants. If the land is dry, they will have made fine roots before the severe weather of winter; and so be ready to proceed with vigour in spring. When, however,

hedges of any of the deciduous sorts are required where the soil is wet or strong clay, it will be proper to defer the planting of such till spring.

As formerly observed, drystone and Galloway dikes may still be carried on with propriety, but by no means any walls that require to be built with mortar, for reasons formerly assigned. It may be proper to notice here, that a drystone or Galloway dike ought never to be founded upon ground when it is deep frozen, otherwise it will be in danger of being much loosened when the frost goes off.

DECEMBER.

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December.

THE NURSERY.

THE operations in this department, recommended either in the months of November or January, are to be carried on in this. Especially, have your rot-heap examined, and treated *again* as advised last month (p. 505), which will serve till the sowing time. In the present instance, the covering of earth placed upon the seeds should be six or eight inches thick, in order to protect them against the effects of severe frosts.

If you have not yet got a sufficient quantity of Ash or Laburnum seeds, they may still be collected with propriety. This is also a very proper time for procuring a full supply of Larch and Scots Fir cones.

It will sometimes happen, that part of the nursery ground which may be damp, such as that adapted for Birch and Alder, will be apt to throw out the young seedling plants. It will be a good

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means of preventing this, to deepen the alleys between the beds, or to cover them with saw-dust of hard-wood timber. Saw-dust of fir timber contains too much turpentine to be used in this case with safety. Indeed, it should never be allowed to be laid upon ground till it has been several years rotted. Tanners bark should also be for several years exposed before it be laid on the Nursery.

ORNAMENTAL PLANTATIONS.

IN favourable weather, continue the planting out of hedge-row and ornamental trees, in all suitable situations ; as advised last month. Be careful not to plant them in too damp a situation at this season of the year. Never attempt to transplant an Evergreen of any kind at this season. All Evergreens should be reserved to the spring or autumn months ; which see.

The work of preparing ground for ornamental plantations may still go on, especially of trenching. It should not be flattened in the working, but left in ridges, and as whole as possible. It is desirable that the greatest possible extent of surface be exposed to the action of the frost, in order the more perfectly to pulverize and meliorate the soil.

Pruning also may still be performed in cases where it has not been done in September ; but that

is a much more proper season for it than this, especially for the gean ; wounds made upon this plant, either in winter or spring, being more liable to gum than when made in autumn.

In cases where the young plantations have not yet been digged rough for the benefit of the winter frost, it may still be done when the weather permits.

FOREST PLANTATIONS.

KEEPING PLANTATIONS DRY.

A variety of circumstances may have laid your young plantations in some parts under water. Examine, therefore, the whole of such as are liable to such an occurrence from their situation ; and take care that they be made dry, or at least as much so as things will admit.

Although we have above urged that the *young* plantations should be kept dry with care, we would not be understood as giving the least latitude as to keeping old woods, or timber trees of any kind, at all in a wet state. Indeed, if the young plantations require to be kept dry to secure their prosperity, old trees require it much more ; inso-much, that when we see old forest trees in a sickly state, our first suspicion generally is, that it arises

from too great a quantity of moisture ; and, in nine cases out of ten, this proves to be the fact.

It generally happens, that, at the first establishment of a plantation, proper ditches and drains are made. But, from a change of masters, or probably from neglect, or it may be from an idea that it is a matter of indifference, they are, in a vast many instances, allowed to be choked up, and the ground is consequently more or less overflowed. In all cases, therefore, where the health and vigour of the trees is an object, let the original drains be scoured, and rather deepened than filled up ; and let new ones be made where required, so that the whole trees may be laid dry at their roots.

We have seen many Larches, Firs, and various sorts of Deciduous trees, to outward appearance good and sound timber, but, when cut down, many of them rotten in the heart, and some of them mere hollow trunks !—where it was evident this evil had been occasioned by an excess of moisture. Damp, or wetness, may be charged as the foundation of several other evils. It reduces Fir-trees to a state inviting to a species of moth ; which is known to be very destructive to sickly fir timber. Very lately, we saw a piece of Scots fir plantation totally destroyed by this insect. The original cause evidently was too much moisture ; for the piece of land was so wet, that it required boots to enable one to go through to examine the trees. The trees in question were from twenty-six to thirty feet

high. The other parts of the plantation on dry ground are just now quite healthy.

The whole of the works recommended in the preceding month may still be carried on in this, together with those advised in *January*; to which we beg leave to refer the reader.

WOODS AND COPSES.

SEE that all Copse Woods be laid dry in the winter. Allow us again to say, that the health and vigour of young and old woods depend, in a great measure, upon the ground being kept dry. Thin out patches of two-year old trees, as advised in *February*.

Continue the operations of preparing ground, as advised last and preceding months. The pruning of young Copse Woods may now go on, as recommended in *January* for Forest Plantations.

Two-year old patches of trees, in young woods, should be thinned out. It is wrong to attempt to raise them by the spade; for this would injure those which are intended for the crop;—they should therefore be pulled out by the hand.

Do not attempt to thin one-year patches; because they will make far better progress when left thick, than when thinned out. In thinning out your trees, still leave them more thick the first

year than they are intended to stand : In a patch of twelve inches, three or four trees may be left. Where Acorns, Chesnuts, or Walnuts have been planted, little thinning will be required ; but Beech, Elm, Ash, Birch, or the like, will require more attention at this season.

FENCES.

THE whole branches of work relating to Fences, either in the last or preceding months, are equally necessary to be carried on in this, when the weather permits : Therefore, in order to prevent farther repetitions (of which there are unavoidably many in a book of this kind), we beg leave to refer the reader to these months for particular information ; and especially to pp. 806—809.

Great attention should be paid, especially at the commencement of a thaw after a snow storm, to keeping ditches clear of all obstructing matters, it being equally important to the welfare of the hedges and the fields, that the water have a free passage.

APPENDIX.

APPENDIX.

No. I.

ON THE FORMATION AND MANAGEMENT OF OSIER PLANTATIONS.

IN the foregoing work, we have only treated of the rearing of Willows, for aquatic hedges, and of plants of the tree kinds for large timber. Indeed, the rearing of Osier plantations does not directly fall under the kind of subjects proposed to be treated of in the Kalendar, although it is not a less important and useful branch of rural concern.

It is well known that, in a variety of instances throughout Scotland, from the varied surface of the country, a great many parcels of ground, of less or greater dimensions, are better adapted for the growth of Willows than for any other crop. Many of these spots contain a soil of a soft texture, and of a quality apt to imbibe and retain too much moisture, after being improved for producing crops of grain, but which moisture would be readily swallowed up by osier plants, greatly to their benefit. Probably there are few crops which can drink up a greater quantity of moisture, and be in luxuriant health, than that under consideration.

Although we readily admit this fact, we are far from allowing that the ground for Osier plantations should be suffered to be wet in the bottom. Indeed, whenever this is the case, the shoots will never arrive to any tolerable consistency for wicker-work, and will never be able to resist the early frosts of autumn. We saw a striking instance of this in 1898, in an attempt to raise a plantation of Willows in a part of the bed of the small lake of Lochore, in Fifeshire. This lake formerly covered a space of five or six hundred acres; and was drained, about thirty years ago, by Captain Park of Lochore. When the water was let off, the bottom proved to be a sludgy sediment, many feet in thickness, and of a quality apparently very rich; but so soft, that nothing could be sown upon it for a considerable time. At length, it acquired such a degree of consistency, as to allow cuts to be made for draining out the water from the body of the soil or sediment. These cuts could only be made to a small depth at first, because the whole was still in so soft a state, that it inclined to every deep opening or cut that was made in it. Willows were planted on a part of it. At the time we saw it, the plantation of willows was surrounded with a ditch more than a yard wide, and nearly as deep; at one side, much deeper and wider: but, when the ground was broke to two feet deep inwards from the ditches, it was as soft as mortar; hence, when the roots of the willows got down that length, they drank too copiously of the moisture; and the consequence was, that they died down generally half their length, and many of them quite to the ground by December, although, in September, they had looked tolerably healthy.

Many more instances of the same kind might be stated. We shall, however, be contented with mentioning

the opinion of a gentleman, who has made the cultivation of Willows part of his employment. He says*,
' Moderate moisture is favourable to the production of
' fine twigs; but water *continually* stagnant, may be con-
' sidered ruinous. The writer has seen good osiers grow
' where water stood in the bottom of an old ditch during
' the greater part of the winter months; but thinks that
' water continually stagnant is very destructive in sum-
' mer, by preventing the wood from ripening; and he
' apprehends, that when good osiers grow in water, the
' roots must reach sound, dry soil, immediately contigu-
' ous; which was the case in the instance mentioned
' above; for the soil was dry and moderately rich also, on
' each side of the ditch.'

It ought, however, to be noticed, that the kinds of Willows which are naturally of a firm and woody texture, as the common sallow (*Salix aquatica*) endure standing water much better than such sorts as make naturally very vigorous pushes like the common hoop willow, and some of the basket willows. We know of a striking instance of this on the estate of Raith in Fife-shire, at the West Mill-dam, part of which is occasionally dry during the summer months, but seldom in winter. Many years ago, the part which is occasionally dry was planted with basket willows of various kinds; but those which thrived best, and continued to live longest, were the hard-wooded kinds, which made naturally small shoots†.

It is presumed that these instances will shew the necessity of completely draining the site of a proposed Wil-

* Mr Shirreff's Paper on Osiers, Far. Mag. May 1805.

† This plantation was rooted up several years ago.

low plantation, as the first step towards its formation, and as the foundation of its prosperity, and consequently of the profit to be derived from it. Drains in any ground to be occupied with a permanent crop of trees, should be constructed upon principles of durability. If the drains be what are called *rubble drains*, the interstices will suddenly be filled up with the fibres of the willow roots, which will creep down to drink the oosing water. They ought, therefore, either to be open drains, or drains built on the sides, and covered over with flags, to prevent their being choked up with the roots. A variety of cases may however occur, where it will be impossible to form covered drains, or where, perhaps, the expence might operate as a prohibition to doing so with the view of planting willows. In such cases, the ground may be formed into beds of a less or greater size, according to circumstances, by cuts or drains of a wideness and depth sufficient to lay the soil dry. These drains will require to be cleaned out every autumn and spring. The scrapings may be thrown abroad upon the general surface of the beds. In several instances, where we have been employed in forming Osier plantations, we have been compelled to make the beds only six feet wide, from the softness of the land; yet such plantations succeeded well.

But, whatever be the width of the beds or ridges between the drains, the surface of grass ought to be well reduced by crops of grain and green crops, wherever the soil will at all produce such.

In preparing ground for an Osier plantation; if the soil be poor, it should be well dressed with dung, as if it were intended for a crop of wheat or barley. The dung most proper for willows is stable dung. We have tried lime as a manure for willows, but found the twigs much

fired or spotted with a sort of canker, and, in attempting to bend them, they readily broke over at the cankered place. Indeed, if a plantation of Osiers be formed previous to a thorough preparation of the soil for the reception of the plants, the saving of the expence will be found a most severe loss, by the diminution of the crop in succeeding seasons.

There are few soils that will not bear Willows; yet some situations are very unfit for them. Dry and exposed grounds, peat-moss, and land covered with standing water, or a quagmire, are not fit. Hollows, the soil of which is composed of rich, soft, earthy particles, and which can be laid dry, are the most eligible for converting into osieries; and, if such can be occasionally soaked with water during the dry months in summer, the situation may be considered perfect, and the advantages will be found very great.

Although we would give a preference to a situation like the above, we are far from attempting to dissuade from cultivating them in others. We know of osieries planted in very different soils, and very differently situated; yet producing very great returns to the owners. A few acres of Osiers planted upon the south exposure of a sloping bank, sheltered from the south-west by a belt of plantation, and in a cold humid, clay soil, on the farm of Hayfield near Kirkaldy, has yielded from 25*l.* to 80*l.* per acre annually for a number of years past. This piece of ground was under a rotation of common agricultural crops for a great many years before being planted with willows; but it was so damp, and so much sheltered from the west by a plantation, and from the north by its situation, that the crops of grain were generally of poor quality. It was therefore consigned to bear

willows, which were planted after a crop of potatoes in February 1801.

Mr Shirreff's plantation of Osiers was nearly under similar circumstances in regard to shelter and quality of soil. The lowness of the situation, and greater humidity of the soil were greatly in his favour. The description of this osier plantation follows. 'It is situated in a bottom, sheltered from the west and north winds by hedges and hedge-row trees, but exposed to the south-east, the fences being low on these sides. The soil may generally be denominated a clayey loam, of coarse quality. It had probably, till about thirty-five years ago, been under natural meadow, and a considerable part of it was subject to be flooded in winter. An open drain or ditch, six feet wide, and three and one half deep, cured it of this inconvenience. It had afterwards been in the rotation of crops common to the practice of good agriculture in the district, and frequently laid down to pasture in excellent preparation for several years, at different times since that period. The pasturage, however, was but coarse; and crops of grain, excepting oats, were seldom valuable.'

In no case should a plantation of willows be attempted (as noticed above) but in prepared ground; excepting perhaps where a few rows may be introduced upon the very brink of a river, or on the top of the counter-ditches, which form in many instances the barrier of the waters, where the soil can scarcely be dug or otherwise meliorated. Nothing can be farther from being good management than planting the truncheons in grass, and allowing the sward to remain green under, or among, the crop.

Having fixed upon the spot, and having also carefully prepared the ground, the next matter in course is procuring the plants. These, notwithstanding of all that has been said about strong old shoots, we would recommend to be of the last year's wood, or of shoots of one year old, taken from the under end of well-ripened shoots of good size, and cut in a slanting direction by a sharp knife, and in lengths of one foot or one foot four inches. Each shoot of good growth may afford two or three plants; the upper end, as far as appears soft, should be discarded; because such produce weak shoots, and do not make so good roots the first season, as the firmer parts of the shoots do. Pieces of two-year old shoots of the same length, and cut in the same manner, may also be used; but such are more expensive, and not better for the purpose than the former. If, indeed, they are intended for planting among grass, or to *beet up* decayed plants in an established plantation, they should be used greater, older, and longer. Two or three year old shoots several feet long, and pushed into the ground perhaps a foot or eighteen inches, are necessary for such purposes. But in a well dressed or prepared field, the first described cuttings are by far the best, whether the plantation be intended for basket twigs or for hoops.

The distances at which osiers for wicker-work ought to be planted, are eighteen inches between the rows, and twelve inches apart in the rows. This distance will not be too thick for at least five or six years; but, after that period, the plants should be alternately stubbed up; which will leave them at two feet apart in the rows.

The stools should be carefully attended to annually from the first year of producing a crop of twigs, to keep them clean of rotten stumps, and not to allow them to be overcrowded with the bottoms of the shoots. When these have become too numerous, they should be carefully thinned out, and also cut down, leaving only an eye or two at the bottom of each, until they be diminished to such a number as the stool is capable of supporting with vigour throughout the season. A basket-maker finds more service from a shoot of six or eight feet in length, than from four to three feet in length; and one of the first dimensions will not exhaust the stool or the land, so much as four of the others.

The proper season for cleaning and thinning the stocks, is from the first of March to the middle of April. It is done by a sharp knife, and if it has been regularly attended to from the establishment of the plantation, it is neither troublesome nor expensive. Indeed, this care is necessary, were it only for keeping them clean of destructive insects. We have seen several instances of neglected stools proving a harbourage for insects, which have eaten up the crop.

Willows are generally planted by being pushed into the ground by the hand, which must be well defended by a piece of strong leather; but sometimes, in pushing in the cutting, the bark is pressed off. In order to prevent this, it is better to use a common dibble shod with iron, and have them planted by it, like ordinary planting in the nursery. Where the ground is any way hard, or where there is a danger of pushing off the bark, they should be planted so as to leave five or six inches above ground, that, when it may become necessary, the top of the stools may be cut off, in order to renovate them.

This may happen to be in ten or twelve years after planting; and the practice will be found of considerable advantage. It is a matter of indifference whether the cuttings be planted in a sloping or perpendicular position.

Some have advised to plant a crop of potatoes among the new planted willow cuttings; but this method is highly destructive to the new formed plantation. Indeed, cuttings of any description require every encouragement to enable them to root freely: But if there be "a potato plant dibbled into the centre of each interspace," after the planting of the willows, even supposing them to be two feet apart, we presume the land must be greatly impoverished, the new planted cuttings retarded in growth, and the ultimate advantage diminished in no inconsiderable degree. It may be *sufferable* to place a potato plant in the centre of each interspace, where the willows are four or five feet distance from each other, and when rooted plants are used; but never when the distance is only two feet, even although rooted plants were used.

After the planting of the osiers, they must be carefully hoed and cleaned: Nothing contributes more to the rearing of a good crop, after due preparation, than cleaning. We know of several plantations of osiers, which have been formed at considerable expence, but having afterwards been let run wild, the crop at present is not annually worth a fourth part of the sum it would have been worth, if it had been duly kept clean by the hoe. Even when the expence is compared with the advantages, the balance is greatly on the side of cleaning. If the work of cleaning be attended to from the first onwards, the expence may be estimated at from

25s. to 35s. *per acre per annum*, according to the nature of the soil; but in no case perhaps will it cost more than 2*l.* Sterling. And money expended, at the above rate, upon the plantation, will be found to yield a return of 300 or 400 *per cent. per annum!*

The spring hoeing of the willow plantation should always be performed by a deep hoe of small breadth, in order that the earth may be stirred to several inches of depth. Indeed, were it not for the great increase of expence, it would be proper to have the interspaces digged by the spade. Subsequent cleaning may be performed by the common draw-hoe, or by the Dutch hoe, with great propriety.

The willows should not be cut till the second season after planting. By being allowed to stand uncut for such a length of time, the stools become stronger, and more able to produce a good crop, than if cut at an earlier period. Indeed, by the third autumn after planting, under the above management, the crop will be of very considerable value.

In establishing a willow plantation for hoops, the same care and attention to the preparation of the ground is necessary, as well as to its quality. Such plantations should never be attempted upon a thin, poor gravelly moor soil, nor indeed in any which is not evidently appropriate for the purpose. Hoop willows, however, require to be planted thinner at the first, than osiers for basket work. If the former be planted two feet between the rows, and eighteen inches between the plants in the rows, it will be thick enough.

Like the others above noticed, they should not be cut till the second year after planting; by which time they will generally have formed one strong shoot, with pro-

bably some inferior twigs. In the first cutting, care must be had not to allow any part of the *small* twigs, or side shoots, to be left, but to cut them clean off. Were a part of these allowed to remain, such might produce a crop of twigs fit for wicker-work; but by no means adapted for the purpose in view. It is better to have a few good growths, than a profusion of others. At no period should any one stool be allowed to bear too many shoots, otherwise they will be small and worthless. Every manager of willows has it in his power to increase or diminish the number of shoots from the stools under his care: For if he take off the shoots clean by the stem of the plant in spring, the number of shoots will be proportionally diminished in the following season.

The proper season for cutting willows, is any time during the month of November, or in the month of March. If they are cut after November, they have the chance of encountering much damp, and severe frosts, which never fail to injure the stools, and diminish the strength of the shoots, in the succeeding season. If the cutting be deferred till the month of April, the sap has probably begun to ascend with rapidity; and must necessarily continue to exude from the wound, till nature find more proper channels in some of the adjoining buds. If, therefore, the cutting of willows be properly attended to in regard to the season, the extremes pointed out will be avoided. No doubt, in some seasons, the winter cutting may extend to the middle or end of December; and the spring cutting from the middle of March to the middle of April, according to the state of the weather.

With regard to the manner of cutting, it may be proper to notice, that the cut should be made to within two or three buds of the place from whence the shoot issued, and even, if possible, to attend to directions in the form of the cut, it should be in a sloping direction, at the back of the uppermost bud left on the bottom of the shoot on the stool.

In cutting hoop willows from the stools, the *swell* at the bottom of the shoot only should be left. This part is amply furnished with proper outlets for the rising sap, so that it is unnecessary to leave so much at the bottom of those as above advised for basket willows, especially as fewer shoots are required in the present case. We are decidedly hostile to the barbarous custom not uncommonly practised by coopers in cutting hoops from the stools. Under the idea of saving the hoops from being split, they hack them off downwards, and thus the under part left upon the stool is split into many pieces, to the manifest injury of the plant.

It may be useful here to remark, that osiers in the peeled state are more fit to be kept to wait a market than if left with the bark on; and they never fail to produce a greater return in the peeled state, after paying for the labour of peeling, than they do as they are cut from the stools.

The operation of peeling is very simple, and may be done by infirm people or by women, at so much a bundle.

The way to prepare the willows for peeling is as follows.—Immediately after cutting them, set them on their thick ends into standing water, a few inches deep, and

allow them to remain in that situation till the growth begins to ascend freely, which will probably be by the end of May. They are then ready to part with the bark.

The apparatus for peeling is simply two round rods of iron, nearly half an inch thick, sixteen inches long, and tapering a little upwards, welded together at the one end which is sharpened, so as that it may be easily thrust down into the ground. When thus placed, in a piece of firm ground, the peeler sits down opposite to it, and takes the willow in the right hand by the small end, and puts a foot or more of the great end into the instrument, the prongs of which he presses together with the left hand, and with the right draws the willow towards him; by which operation the bark will at once be separated from the wood: The small end is then treated in the same manner, and the peeling is completed.

Good willows, peeled in the above manner, have been sold, for some seasons past, at from 6s. 6d. to 7s. the bundle of four feet circumference. After being peeled, they will keep in good condition for a long time, till a proper market be found.

In regard to the kinds of willows proper to be planted, much might be said; for no kind of plant generally cultivated exhibits so many different species as the willow. Several of these, it must be owned, are very improper for being cultivated for the above purposes; and to this circumstance, in some instances, may be attributed the failure of the crops. We may observe, in general, that by far the easiest way of procuring proper sorts, is to get them from some established plantations,

containing willows of good quality, approved by basket makers and coopers.

We shall here, however, describe, in a slight and popular way, the different species of willows which best deserve to be cultivated for hoops and for the various sorts of wicker-work. We may premise, that in every district both of Scotland and England, basket makers and osier growers have provincial names for their willows. To mention these would be quite nugatory. We shall therefore give the correct *English names*, as fixed by Dr Smith, and also the *scientific or botanic names*; and by means of these united, we doubt not that the species recommended may, with tolerable certainty, be procured at the principal nurseries both in England and Scotland, by those who are desirous of cultivating only the most select kinds.

The Common Osier (*Salix viminalis*) is the most frequent species in willow plantations, and it is naturalized in many parts of Scotland. The leaves are long, waved at the edges, but not serrated; shining green above, and silvery beneath. The shoots grow very long and straight, and are tough; well calculated for the larger sorts of baskets, hampers, and crets, and likewise for hoops. Several well marked varieties occur in osier plantations, and are there distinguished by different names. It is well known, that in most species of willow, the male and the female flowers are produced on separate plants; it often happens that the female plant is considered by the osier growers as a distinct kind; and if they differ considerably in quality, the distinction is fair; but kinds thus come to be created, which the botanist cannot recognize.

The Auricled Osier (*S. stipularis*) is a very good willow. The two-year old shoots make excellent rods for

baskets, cradles, bird-cages, and such articles; and the one-year shoots are used as *fillings*. The shoots are long, nearly equal in thickness throughout their extent, and somewhat downy, or hoary, particularly at the tops or extremities. The leaves are alternate, with footstalks, long and narrow, somewhat notched on the edges, green and smooth above, woolly below. The stipulæ or leaf-scales are conspicuous and remarkable, resembling a pair of ears: both the English and the botanic name have reference to this part of the plant. It occurs in many willow plantations, but is not much attended to, being often confounded with the common osier.

The Green Osier (*S. rubra*), is an excellent basket willow, but it is not very common. The shoots are very long, tough, smooth, and of a grey colour, occasionally inclining to purplish. The leaves are narrow and very long, from three to four inches, bright green on both sides; and serrated. The trivial name *rubra* is not apposite; but it has been retained by Dr Smith in his excellent *Flora Britannica*.

The Basket Osier, emphatically so called by Dr Smith in his *Flora Britannica*, is perhaps the very best willow for the finer sorts of basket-work. It is not, however, much known in Scotland, though a native; but it well deserves attention. The wands are of a yellowish ash colour, sometimes purplish; smooth, very flexible and tough. The leaves are alternate, on footstalks, from two to three inches long, somewhat serrated, chiefly towards the top; dark green above, and glaucous or pale bluish beneath. This species is described in Dr Martyn's edition of Miller's *Gardener's Dictionary*, under the name of *Salix fissa*: in the *Flora Britannica* it is named *S. Forbyana*, in honour of the Rev. Mr Forby of Norfolk.

The Long-leaved triandrous Willow (*S. triandra*), is common in osier beds, and its stools afford most excellent shoots for basket-work, long, slender, pliable and tough; they are smooth, of a brownish colour, and towards the top they are fluted or grooved. The leaves are long, and closely and strongly serrated. When permitted to grow up, this species attains the size of a tree, and the male flowers or catkins are very ornamental in April and May.

The Almond-leaved Willow (*S. amygdalina*), is like the preceding, but is readily distinguished by its leaves being broader, so as to resemble those of the almond-tree. This species forms but an indifferent osier, though it is often used, particularly in the north and west of Scotland, where it is frequent as a native.

The Long-leaved Sallow (*S. acuminata*), produces numerous shoots, which, in the second year, form pretty good rods. The leaves are about two inches long, and one inch broad; dark green above, and cottony underneath. It is not a common species in Scotland.

The Velvet Osier (*S. mollissima*), is a useful sort. It is easily distinguished by its leaves being very smooth and green above, and very silky and soft beneath. Its shoots are long, and very numerous, but not tough. When allowed, however, to remain for two years, they make most capital rods. The shoots are distinguished from many others by their forming a large bend where they come off from the stool. This species is indigenous to many places of Scotland, as well as England, and should be more cultivated in osier grounds than it is.

The Bitter purple Willow (*S. purpurea*), is not common in Scotland; but in Yorkshire, its long slender twigs

are sometimes used for fillings to the finer sorts of baskets. It makes excellent bands or withes, being extremely tough; and the bark is so exceedingly bitter, that no vermin will attack it. This, it is believed, is one of the sorts in demand for tying the hoops on the beef barrels in the Navy Victualling Yard. The leaves are remarkable for becoming broader upwards or outwards; they are smooth, and somewhat glaucous; but the excessive bitterness of the leaves and bark, forms perhaps the easiest mark of distinction.

The Rose Willow (*S. Helix*, Fl. Brit.; *S. monandra* of Hoffman). This is very like the former, but is not bitter. It is more common. Its numerous slender purplish twigs make very good fillings for fine basket work. It is sometimes called Packthread willow.

The Boyton Willow (*S. Lambertiana*) resembles the Rose Willow; but its leaves are shorter, and have shorter leaf-stalks. It is one of the hardest wooded willows. Its twigs are much used for basket fillings in England; and it is well known in Scotland by the name of *Packthread Willow*.

The yellow Willow or golden osier (*S. vitellina*), produces handsome shoots, of a yellow colour and shining, and well adapted for basket-work. The leaves are nearly sessile, or have only a very short footstalk; they are minutely serrated, smooth and shining above, and somewhat of a bluish tint, and silky beneath. In osier grounds, almost every willow with a yellowish bark is called a *yellow willow*; but the true *Salix vitellina* is not common, at least in Scotland.

The Purlane Willow, or Cane Willow of the late Dr Walker, (*S. decipiens* of Hoffman?), produces very beautiful shoots, with a fine lively bark, like some sorts

of cane. It forms a good basket osier. It grows sometimes to a large size, and then greatly resembles the Crack Willow, *S. fragilis*.

The Dark Broad-leaved Willow, or, as it is sometimes called, the Black Willow, (*S. nigricans*). This is scarcely to be found in Scots osier grounds; though it occasionally occurs in those of England. It is certainly not worth cultivating, its wands being apt to break.

The Violet Willow (*S. violacea* of Don's Cambridge Catalogue), deserves the same character. It is much fitter for an ornament in the shrubbery, than to be planted as an osier. Its one-year shoots are very flexible till about December or January; but after that period they readily snap.

The tree Willows mentioned in a former part of this work (p. 104.) may be so kept down and managed as to cause them to produce numerous shoots, forming excellent rods, hoops, and poles.

The Sweet or Bay-leaved Willow (*S. pentandra*) is a pretty common native of Scotland: Here, however, it is scarcely attended to as an osier; while in Yorkshire its shoots are often used for making the larger sorts of baskets, hampers, and crets.

The Crack Willow (*S. fragilis*) is frequent in willow plantations, and, when duly kept down, forms a good osier. The shoots and twigs are flexible and tough; the name alluding only to the circumstance of their very readily separating at the point of insertion into the trunk. The leaves are about four inches long, and an inch and a half broad, deeply serrated. The bark of the shoots is of a red colour.

The Bedford or Dishly Willow (*S. Russelliana*), has already been particularly recommended to attention as

a tree. When rightly managed, its stools afford very good shoots for hoops or for poles.

The Common White, or Huntingdon Willow (*S. alba*) possesses similar qualities with the Bedford Willow. The two-year old shoots make pretty good hoops, and excellent poles or stakes.

Of the above species, nine are decidedly natives of Scotland, viz. *S. triandra*, *mollissima*, *amygdalina*, *helix*, *pentandra*, *fragilis*, *decipiens*, *russelliana*, and *alba*. *S. viminalis*, or common osier, is completely naturalized, being found on the banks of streams, and by the sides of ditches near every village. The same thing is in some measure true of *S. stipularis* and *vitellina*. Most of the other species are either indigenous to England, or naturalized in the osier holts of that country. The Violet Willow is therefore the only truly exotic species here mentioned. It was introduced from Russia not many years ago.

No. II.**LIST OF SOME REMARKABLY LARGE TREES
IN SCOTLAND.**

IN the section on Soils, and in that on Kinds of Trees, in the foregoing work, we have mentioned some instances of trees having grown to a large size. There are, however, much larger trees in Scotland than those there taken notice of; a list of some of which we here subjoin, as a stimulus to the cultivation of timber in this country. It is admitted, on all hands, that our climate is more varied and unsteady, and therefore less propitious to the growth of trees, than that of England. Yet it is most agreeable to observe, that many of the kinds of trees in the list here subjoined, have attained a size equal, and in several instances superior, to any to be found in the sister country. We particularly allude to our Larches, Scots Firs, the Prior Letham Sycamore, Finhaven Chesnut, and the Fortingal Yew. Perhaps we could not give a better comment on the age of the last mentioned venerable tree, than that of a native of France, M. Simond, in the ‘*Journal of his Tour and Residence in Great Britain*,’ vol. i. p. 438. ‘I subjoin,’ he says, ‘a view of the lake,’ (of Patterdale on Ulswater), ‘and another of the venerable ‘ruins of an enormous yew-tree in the church-yard of ‘Patterdale. The trunk, perfectly hollow, is twenty-six ‘feet in circumference; the head is gone, and the lowest

‘ boughs only remain, much curtailed in their length,
‘ which must have been very great. We enquired of an
‘ old inhabitant, what the tradition was about this tree;
‘ how old it was:—he answered very seriously, 2000 years!
‘ The age of a tree is difficult to be ascertained,
‘ for it does not attract sufficient attention to become
‘ the object of tradition, till it has attained a very
‘ great size, and when a great part of its life is spent.
‘ Mr Gilpin has collected in his *Remarks on Forest*
‘ *Scenery*, some curious facts on the age and sizes of ex-
‘ traordinary trees, principally oaks; he traces the age of
‘ some of these trees as far as 900 years back. Some
‘ oaks are now in existence, which were hollow and de-
‘ clining, in the days of Queen Elizabeth. One of the
‘ Colleges at Oxford, was built, by express order of its
‘ founder, William de Wainfleet, 450 years ago, near The
‘ *Great Oak*. This great oak, a mere shell, fell of itself in
‘ 1788; and as it may be supposed to have attained its
‘ meridian at the time of the foundation of the College,
‘ it gives the tree nine centuries. I shall mention one
‘ more:—the tree in the New Forest, against which the
‘ arrow glanced which killed William Rufus, 700 years
‘ ago, was still in existence, marked by tradition, but a
‘ few years since; and must have been a well grown tree
‘ at the period of the accident. It is perhaps worthy of
‘ remark, that all these venerable plants which have at-
‘ tained such an advanced age, are equally noted for their
‘ size, far exceeding that of their fellows; while among
‘ animals, I mean among individuals of the same species,
‘ it is almost the reverse. Gilpin mentions a yew-tree at
‘ Fortingal, near Taymouth, in Scotland, 56½ feet in cir-
‘ cumference. Our Patterdale yew is a mere twig to
‘ this; and the good people of its neighbourhood, must

‘ give it full 8000 years, measuring more than four times
 ‘ the solid contents of the other.’ He adds, ‘ The family
 ‘ of the yews is almost extinct in England.’ We yield with
 pleasure, the palm to the justly celebrated Oaks of Eng-
 land; but even the oak produced in Scotland, it will be
 seen, has arrived to no despicable size, nor is the quality
 of its timber inferior for ship-building, as far as it can be
 applied, to any in the world. We have therefore the ut-
 most encouragement to proceed in its cultivation. Let
 us, however, as much as possible adapt the kinds of our
 trees to the quality of the soil and situation, and our suc-
 cess will be equal to our most sanguine expectations.

THE OAK.

P. IN.

An oak tree, at Killearn Place, in Stirlingshire,
 in 1795, measured in circumference * - 12 0

Another at Cockwood, in Annandale, in the
 month of April 1773, measured, at six feet from
 the ground, in circumference, - - - 14 0

This tree was about 60 feet high, and supposed
 to be about 230 years old †.

At Blairquosh, in the parish of Strathblane,
 Stirlingshire, an oak measured, in 1796, in cir-
 cumference ‡ - - - 15 0

The remains of a decayed oak, upon the road
 between Inverness and Strontian in Argyleshire,

* Stat. Acct. Vol. XVI. p. 3.

† Walker's Essays on Nat. and Rural Econ. p. 4.

‡ Stat. Acct. Vol. XVIII. p. 580.

were measured in October 1764, and found to be in girth, at a foot above the ground *; - 17 3

Wallace's oak, so named for ages, must have been a large tree 500 years ago. It was situated in a wet clay soil, in the Tor-wood, near Falkirk, and in 1771 was supposed to be in girth, at four feet above the ground, - - - - - 22 0

No trace of this venerable tree now remains.

The largest oak which we have noticed in Scotland is in the old oak wood on the north side of Loch Arkeg, in Lochaber. When measured, it was found to be in girth, at four feet above the ground †, - - - - - 24 6

In a moss in the parish of Auchterderran in Fife-shire, the remains of an oak which has its root several feet above the bottom of the moss, measures in diameter at the root

A remarkable oak at Lee, in Lanarkshire, one of the seats of Sir Charles Lockhart, Bart. It is in girth at the ground - - 33 0

And 19 feet in girth at 7 feet high. It is conjectured to be at least 1000 years old, since it was of so much importance as to be mentioned in a charter granted to the Lee family upwards of 600 years ago. It is commonly called the Pease Tree.

Walker's Essays, p. 6. He says, that many remains of oaks were observed, approaching to the same size, in this valley of Morven; situated among rank heather, in deep peat-earth, lying above banks of mountain gravel.

† Walker's Essays, &c. p. 9.

THE LARCH.

This is but a newly introduced tree ; none of them are above 60 years old ; the oldest are to be found at Dunkeld. The finest of these is 100 feet high, and in circumference at the ground 10 0

In Monzie garden there are four larch trees, said to be the largest in the island. They are not yet 60 years old ; yet the largest one is 80 feet high, and its girth at the ground is 16 0

Other two are about the same height ; but the circumference of the one at the ground is 15 0

The other is - - - - - 9 0

And the last is 90 feet high, and at the ground is in girth only * - - - - - 8 0

A Larch at Raith planted in 1786, girth at breast height, in 1819 - - - - - 5 4

THE ASH.

An ash at Lord Morton's, near Aberdour, in Fifeshire, measured in March 1812, extended in length of bole 50 feet, and in girth, at four feet high, - - - - - 10 3

An ash at Newbottle, in Mid-Lothian, standing east from the house, near the river, in the month of July 1789, measured, in circumference †, - - - - - 11 4

* Stat. Acct., Vol. XV. p. 254.

† Walker's Essays, p. 12.

	F.	IN.
An ash at Whittinghame in East Lothian was in girth, 1819, - - - - -	12	6
At Biel in East Lothian, near the East Bridge, an aged ash was in girth, at breast height, July 20. 1812, - - - - -	11	4
An ash in the island of Loch Leven, in Fife-shire, in September 1796, measured, in circum-ference; at four feet from the ground, -	12	0
An ash at Yair, in Selkirkshire, measured, at the surface, in circumference *, - - -	12	9
An ash near the church of Logierait, in Perth-shire, measured, at four feet from the ground, in 1770 †, - - - - -	16	0
An ash tree at Wemyss Castle, in Fifeshire, growing about 100 yards from the door of the Castle, measured, on the 13th March 1812, 35 feet bole ; and in circumference, at four feet from the ground, - - - - -	15	9
An ash in the church-yard of Bonhill, in Dum-bartonshire, in September 1784, measured in cir-cumference at the surface - - -	33	0
The <i>Glamis Ashtree</i> at Castle-Huntly in Perthshire, measured in circumference at the ground - - - - -	27	0
And at a yard high ‡ - - - - -	17	0
At the river of Blackburn, in the parish of		

* Selkirkshire Rep. p. 284.

† The same tree measured in March 1812, was found to be, at breast height, 21 feet 6 inches in circumference.

‡ Statistical Account, vol. XIX. p. 467.

	F.	IN.
Castletown in Roxburghshire, the trunk of an old ash measured in circumference *	16	0
An ash at Midstrath, in the parish of Bins, at the ground †	20	0
An ash near Deskford, in the county of Banff, called St John's Tree, measures in girth ‡	24	5½
A few yards from Cessford Castle, in Roxburghshire, there is a venerable ash tree, which measures at the base §	27	8
An ash tree near Bonhill House, in Dumbartonshire, which is surrounded with a sloping bank of earth, about three feet in height, measured, in circumference, in September 1784, at four feet above the general surface of the ground ¶	34	1
An ash tree in the church-yard of Kilmalie in Lochaber, burnt down during the troubles in 1746, was long considered as the largest and most remarkable tree in Scotland. Its remains were measured in October 1764, and, at the ground, the circumference was no less than	58	0

* Stat. Acct. vol. XVI. p. 79.

† Id. vol. IX. p. 129.

‡ Id. vol. IV. p. 311.

§ Id. vol. VIII. p. 36.

¶ Walker's Essays, p. 15. The proprietor has fitted up a room in the inside of it with benches around, and glass windows. The diameter of the room is eight feet five inches, and its roof is near eleven feet in height.

|| Walker's Essays, p. 17. This tree stood on a deep rich soil only about thirty feet above the level of the sea, in Lochiel, with a small rivulet running within a few paces of it.

THE ELM.

	F.	IN.
On the estate of Castle-Huntly there are several fine Scots elms, which measure, at three feet from the ground, about *	11	0
At Lord Morton's Aberdour, Fife, there is a Scots elm, which measured March 10. 1812, forty feet length of bole; and in girth	11	6
Two elms at Yair in Selkirkshire, measure, each, at the surface of the ground †	13	0
An elm tree in the parish of Roxburgh, in Tiviotdale, called the <i>Trysting Tree</i> , was measured in 1796, and its girth at four feet from the surface of the ground, found to be ‡	30	0
An elm on the lawn at Breadalbane Castle measured in September 1814	15	9

THE BEECH.

At Melville Castle in Fife, the seat of the Right Hon. the Earl of Leven, there is a very handsome beech-tree called the Colonel : the trunk is 36 feet high ; girth, at three feet from the ground, June 1812,	10	3
A beech at Leslie House, in Fifeshire, measured, in March 1812, by estimation, 56 feet to the branches, and was in girth, at breast high,	11	0

* Statistical Account, XIX. p. 464.

† Selkirkshire Report, p. 287.

‡ Statistical Account, vol. XIX. p. 134.

	F,	IN
A beech at Kinross House, in 1816, girth	12	0
A beech in front of Raith House, in Fife, measured, at two feet from the ground, April 6.		
1802 - - - - -	9	7
On 27th November 1804, - - -	10	1
On 3d July 1807, - - -	10	7
On 17th March 1810, - - -	11	1½
On 18th September 1819, - - -	12	9
Another, at the same place, is 30 feet of bole, and, at the same height from the ground, in girth - - - - -	13	8
Another, at breast high, at the same place and time, measured in circumference -	15	0
Another, at same height, with a trunk 45 feet, was in girth - - - - -	10	2
Another, at same height, with a trunk 60 feet in height, in girth - - - - -	10	0
Near the Abbey of Balmerino, on the banks of the river Tay, a beech tree, measured in 1793, was found to be in girth * - - -	12	7
A beech at Inverary, whose stem was 12 feet. in length, and the diameter of its head 90 feet, had a trunk whose circumference was † -	14	0
A beech near the Castle of Kelly, in the county of Fife, was measured in 1793; its stem was 30 feet in height, and the circumference ‡	16	0
The large beech at Newbottle Abbey, stand- ing on the lawn behind the house, was measured		

* Stat. Acct. vol. IX. p. 223.

† Argyleshire Report, p. 146.

‡ Statistical Account, vol. XIII. p. 3.

	<i>P.</i>	<i>IN.</i>
in July 1789, and the circumference ascertained to be - - - - -	17	0
The large beech at Ormiston-hall, in East-Lothian, measured, in May 1762, in circumference - - - - -	18	10
A beech near the house of Oxenford, in Mid-Lothian, was measured in June 1763, and, at three feet high, the circumference was *	19	6

THE SILVER-FIR.

A silver-fir, at the house of Polkemmet, in West Lothian, measured, in October 1799, in circumference - - - - -	10	0
A silver fir, in Binning wood, 70 years old, girth at breast high on the 28th July 1812 †, 10	4	
The above tree was planted in 1705 ‡.		
A silver fir, in the old garden at Woodhouselee, in Mid-Lothian measured, in March 1793, ¶	11	1
A silver-fir, at Drumlanrig, in Nithsdale, measured, in April 1773, - - - - -	12	0

* Walker's Essays, p. 21.

† Binning Wood is a marked display of a correct judgment in the appropriating of the kinds of trees to the nature of the soil, and reflects great honour on the memory of the *Lady* who planned it. It will be a fund of wealth to the Noble Earl's family fifty or sixty years hence.

‡ Walkers Essays, p. 36.

¶ Idem, p. 36.

SCOTS FIR.

F. IX.

There is in Gordon Castle an uncommonly large square board of Scots fir, made from a tree which grew in Glenmore wood. The board measures five feet six inches square., It was presented to the Duke of Gordon by the Company who bought that wood from his Grace.

A Scots fir, at Inverary, measures in circumference * - - - - - 10 0

A Scots fir at Castle-Huntly, in Perthshire, was measured in 1796, and the circumference, at three feet from the surface of the ground, was - - - - - 18 6

The same tree measured close by the surface of the ground, was in circumference - 19 0

THE SYCAMORE.

A sycamore at Nisbet, in Berwickshire, standing on the lawn behind the house, and from 60 to 70 feet in height, was measured in September 1795, and the girth found to be - 12 3

A sycamore at Castle-Compbell, near Dollar, growing at the back of the Castle, measured, in March 1812, at breast high, in girth - 12 0

There are other two sycamores on the same extremely exposed spot, but smaller than the one measured. These trees are remarkable for hav-

* Argyleshire Report, p. 146.

F. IN.

ing lived many centuries, and until their neighbours, three ash trees of very considerable size, have died; the sycamores are still vigorous.

A sycamore at Lord Morton's, Aberdour, was measured on the 10th March 1812, and the bole was found to be 45 feet, and, at breast-height, in girth - - - - - 14 0

Another at the same place, has a bole of 50 feet in length, and is in girth at same height 13 5

Both these are very beautiful trees.

A sycamore at Torwoodlee, in Selkirkshire, measures at the surface of the ground * 13 7

A sycamore at the house of Rosedoe, in Dumbartonshire, measured in 1795, at 30 inches above the ground †, - - - - - 13 7

A sycamore in the garden at Castle-Menzies, in Perthshire, measured in circumference, in September 1778, - - - - - 16 8

An old sycamore tree at Ninewells, in Berwickshire, measured in girth, in 1795, a little below the boughs ‡, - - - - - 17 0

A sycamore at Calder-house, in Mid-Lothian, standing by the road leading from the house to the church, measured, in October 1799, - 17 7

At Castle Menzies, there are a number of fine sycamores, on the west side of the garden. I measured two of them September 1814.

* Selkirkshire Report, p. 285.

† Statistical Account, vol. XVII. p. 245.

‡ Idem, vol. XIV. p. 46.

	P.	IN.
One - - - - -	17	0
Another - - - - -	15	5
At the family of Breadalbane's burying place, near Killin, there is a fine sycamore, which mea- sured in September 1814, in girth - - -		
	16	0
The <i>Prior Letham Plane</i> , or sycamore, for- merly mentioned in a note (p. 64), measured, in girth, at the surface, in January 1811, -		
	26	8
A striped sycamore at Raith, south of the house, measured, 1819, in girth - - -		
	8	11
Another, same place, - - -	8	4

HUNTINGDON WILLOW.

One at Raith, 10 years old, girth -	3	9
Another, at the same estate, near Abbotshall Church, in 1819, girth - ..	11	11

THE CHESNUT.

A chesnut, at Lord Murray's, in Fife, has 9 feet bole, and is in girth, March 1812, -	11	3
A chesnut, at Leslie House, in Fife, has a bole 36 feet in length, and was in girth at breast-high, March 1812, - - -	8	6
A chesnut at Newbottle, in Mid Lothian, near the house, measured in girth, July 1789, -	11	9
A chesnut at Inverary, in Argyleshire, which has a stem 18 feet in length, measured in girth, in 1794 *, - - -	12	6
There is a chesnut tree in the old garden at Balmerino, the bole of which measures -	15	0

* Argyleshire Report, p. 146.

At Fernie, in Fife, a little way south of the house, there grows a chesnut tree in a deep hazely loam, which measured in girth, 1812, - 14 0

At Raith, in Fifeshire, on the sloping grounds south of the house, a chesnut has a bole 20 feet high, and girth, 1819, - 10 6

Another, at same place, a few yards distant, 9 8

A group of chesnuts had been planted upwards of 300 years ago, near Brechin Castle, in Forfarshire. The largest was blown down 30 years ago, bole 22 feet, girth - 17 0

There are still six of them standing, one of which is in girth - 10 10

Another - 10 6

And they are very healthy trees, and of great height. They were measured in July 1812.

There are four chesnuts in the south-east of the lawn of Breadalbane, Perthshire, measured 1814,

One in girth - 13 3

Another - 12 5

A third - 12 10½

At Castle Menzies, Perthshire, at the head of the orchyard, I measured three chesnuts, September 1814, in girth at breast-height,

One - 12 11

Another - 12 2

Another - 10 4

HAWTHORN.

A hawthorn at Leven Castle, in Fife, measured, in July 1812, in girth - 6 10

A hawthorn at Raith, girth, 1819, - 5 10

BLACK POPLAR.

	F.	IN.
A fine tree of this kind at Alloa House, in Clackmananshire, measured in girth, at three or four feet high *,	13	6
A tree of this kind at Southfield, in Fife, about 20 years old, girth, 1819,	7	1

THE YEW.

A yew tree in the garden in Broich, Stirlingshire, measured in circumference, at the height of two feet †,	10	0
A yew in the garden at Ormiston-hall, in East Lothian, measured in girth, in May 1762,	10	3
A yew at Balikinrain, in Stirlingshire, measured in girth, in 1794 ‡,	10	2
A yew at the house of Rosedoe, in Dumbartonshire, measured in circumference, 18 inches above the ground, in 1795 §,	12	6
A yew in the island of Inch-Lonach, in Loch-Lomond, measured, in August 1770,	10	7
Another, the largest in the same island,	13	0
The Great Yew at Fortingal, in Perthshire, measured by the Hon. Judge Barrington, previous to the year 1770, was in girth	52	0
At Blair Castle, in Perthshire, a yew, east of the garden wall, girth in 1819,	8	0

* Statistical Account, vol. VIII. p. 594.

† Statistical Account, vol. XV. p. 328.

‡ Idem, vol. XVI. p. 111.

§ Idem, vol. XVII. p. 245.

|| Philos. Trans. 1770, p. 37.

	P.	IN.
At the old Castle at Whittingham, a yew in 1819, measured	8	4

THE HOLLY.

At Lord Murray's, in Fifeshire, there is a holly with a stem of 12 feet, and the trunk is in circumference, at 5 feet high,	6	3
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At Lord Morton's, Aberdour, Fifeshire, there is a holly that measures in circumference, at the same height	5	0
--	---	---

At the Earl of Haddington's, at Tynninghame, a holly, girth at breast-height, July 1812,	5	0
--	---	---

At Lawhill, in Fifeshire, a holly has a trunk 9 feet high, and the branches extend 34 feet; girth at breast-height, in February 1817,	6	0
---	---	---

CEDAR OF LEBANON.

On the estate of Biel, East Lothian, grows, in the pleasure ground south of the Castle, a cedar 40 feet in height, with a bole 12 feet in length, and girth, at breast-high, 20th April 1812,	10	4
---	----	---

The same in October 1819, girth	11	2
---------------------------------	----	---

A cedar of Lebanon, at Culross Abbey, in 1819, girth	9	10
--	---	----

THE WALNUT.

A walnut at the side of a running water, on the south side of the Castle at Beil, girth in 1812	8	3
---	---	---

Another on the same estate, but on the north side of the Castle, girth 1812,	11	7
--	----	---

	<i>p.</i>	<i>in.</i>
A walnut at Culross Abbey, measured in 1819,		
girth - - -	11	10
A walnut at Raith, front of the house, 1819,		
girth - - -	7	9

PLATANUS OCCIDENTALIS.

On the estate of Beil, in East Lothian, there is a platanus growing near the fish-pond, supposed 45 feet in height, and girth, in July 1812, 7 1

Another near the same place, and measured at the same time, 8 5

PORTUGAL LAUREL.

Some Portugal laurels planted in 1787, at Raith Gardens, in Fifeshire, on a thin light soil, incumbent on a quick sand, have made amazing progress :

One, girth in 1819	-	-	3	11
Another, two feet from the ground,	-	-	4	1
Same, at the surface,	-	-	5	2
Another, with a fine stem,	-	-	3	10
Another, at two feet from the ground,	-	-	4	0
Same, at the surface,	-	-	5	1

BLOODY BEECH.

At Raith Gardens, a fine plant, girth in 1819 3 1

This beautiful tree affords wood with fine red veins, which must make very desirable furniture, if the tinges of colour should remain.

WHITE AMERICAN OAK.

P. 114.

A white oak on the Castlehill, at Raith, was planted in Fifeshire 1785, and girth at two feet from the ground, in 1813, 2 11

The same tree, girth at same height, in 1819, 3 11

This white oak is a very elegant plant. The trunk is straight, with little taper, very white and shining, and of a great height. The top branches are finer and stronger than the common or black oak. The leaves are larger and less notched.

Birkbeck, in his Tour to the Illinois in America, describes the white oak as the finest of the American trees, p. 70. And when speaking of the quality of its timber, he says, p. 71., ‘ White oak is valuable for a great variety of uses ; particularly where toughness is required. In proof of its possessing this quality in an extraordinary degree, it forms the material of an American waggoner’s whip. A tapering piece of this wood is cleft in nine, from the small end to within a foot of the other end ; and what remains, is solid for the hand. The nine spleets are then twisted by three, and the threes again twisted together : the whole is then sewed in a case of black leather, and a silken thong added, which completes the whip.’

EVERGREEN OAK.

There are many large specimens at Biel. One measured, 22d September 1819, at breast-high, 7 4½

No. III.

**GENERAL VIEW of the AMOUNT of WASTE
LANDS in SCOTLAND; from the Report of the
Committee of the Board of Agriculture.**

<i>County.</i>	<i>Statement on what founded.</i>	<i>Distinction of Lands.</i>	<i>Number of Acres.</i>
Aberdeen -	County Rep. p. 127.	Unimproved Lands.	374,400
Argyle - -	Gen. information	{ Waste & Moun- tainous Districts. }	785,733
Ayr - - -	Ditto -	Moorish Waste	218,454
Banff - -	Ditto -	Wastes and Hills	290,000
Berwick -	County Rep. p. 10.	Moor, Moss, &c.	126,000
Bute and the Hebrides }	Hebrides Rep. p. 60	Moors, Wastes, &c.	2,880,000
Caithness -	County Report	Wastes and Commons	368,000
Clydesdale -	Ditto. p. 17. -	Moors. &c.	250,000
Clackmannan	Gen. information	Wastes and Moors	25,000
Dumbarton -	Ditto -	Wastes	164,266
Dumfries -	Ditto -	Wastes and Commons	200,000
Elgin - -	Ditto -	Ditto	350,000
Fife - - -	County Rep. p. 1.	Hill, Moss. &c.	64,000
Forfar - -	Ditto. p. 1.	Wastes in Eng. acres	71,875
Inverness -	Gen. information	5-6ths Waste	1,695,933
Kinross. -	Ditto -	Wastes	25,000
Kirkcudbright	Galloway Rep. p. 1.	3ds Waste in Eng. acr.	366,734
East-Lothian	Gen. information	Wastes	55,000
West-ditto -	County Rep. p. 5.	Do. in Eng. acres	14,336
Mid-ditto -	Ditto, p. 7. -	1-3d Waste	76,800
Mearns - -	Gen. information	Wastes and Commons	164,266
Nairn - - -	Ditto -	Ditto	10,000
Orkney - -	Ditto -	Ditto	700,000
Perth - - -	Ditto -	Nearly 1-3d Waste	1,321,600
Renfrew - -	Ditto -	1-6th Ditto	24,533
Ross & Cromarty	Ditto -	5-6ths Ditto	1,480,000
Roxburgh -	County Rep. p. 58.	Heath & Hill pasture	250,000
Selkirk - -	Ditto, p. 15.	Do. in Eng. acres	145,000
Stirling - -	Gen. information	Wastes and Commons	120,000
Sutherland -	Ditto -	5-6ths Waste	1,232,000
Tweeddale -	County Rep. p. 1.	Wastes in Eng. acres	169,360
Wigton - -	Galloway Rep. p. 1.	Moorlands ditto	196,934
Total in Scotland			14,218,224

No. IV.

TABLE, showing the NUMBER of TREES which may be planted on a Scots or an English Acre, from the Distance of 1 Foot to 20, at Intervals of 6 Inches; and from 20 Feet to 25, at Intervals of 1 Foot; and from 25 to 50, at intervals of 5 Feet.

SCOTS ACRE.			ENGLISH ACRE.		
Distance in Feet.		Number in an Acre.	Distance in Feet.		Number in an Acre.
F.	IN.		F.	IN.	
1	0	54,760	1	0	43,560
1	6	24,337	1	6	19,360
2	0	13,690	2	0	10,890
2	6	8,761	2	6	6,969
3	0	6,084	3	0	4,840
3	6	4,470	3	6	3,555
4	0	3,422	4	0	2,722
4	6	2,704	4	6	2,150
5	0	2,190	5	0	1,742
5	6	1,810	5	6	1,440
6	0	1,521	6	0	1,210
6	6	1,296	6	6	1,030
7	0	1,117	7	0	888
7	6	973	7	6	774
8	0	855	8	0	680
8	6	757	8	6	602
9	0	676	9	0	537
9	6	606	9	6	482
10	0	547	10	0	435
10	6	496	10	6	395
11	0	452	11	0	360
11	6	414	11	6	329
12	0	380	12	0	302
12	6	350	12	6	279
13	0	324	13	0	257
13	6	300	13	6	239
14	0	279	14	0	221
14	6	260	14	6	207
15	0	243	15	0	193
15	6	227	15	6	181
16	0	213	16	0	170
16	6	201	16	6	160
17	0	189	17	0	150
17	6	178	17	6	142
18	0	169	18	0	134
18	6	160	18	6	126
19	0	151	19	0	120
19	6	144	19	6	114
20	0	136	20	0	108

562 TABLE OF TREES IN AN ACRE. [*App. IV. & V.*

SCOTS ACRE.				ENGLISH ACRE.			
Distance in Feet.		Number in an Acre.		Distance in Feet.		Number in an Acre.	
At intervals of 1 foot.	F.	IN.		At intervals of 1 foot.	F.	IN.	
	21	0	134		21	0	98
	22	0	113		22	0	90
	23	0	103		23	0	82
	24	0	95		24	0	75
At intervals of 5 feet.	25	0	87	At intervals of 5 feet.	25	0	69
	30	0	60		30	0	48
	35	0	44		35	0	35
	40	0	34		40	0	27
	45	0	27		45	0	21
	50	0	21		50	0	17

No. V.

AVERAGE PRICES of TIMBER and of OAK BARK, at the Port of Leith, for several Years.

PRICE OF TIMBER PER FOOT.

	1799.	1809.	1810.	1811.
	£. D.	£. D.	£. D.	£. D.
Oak, English	2 10 —	4 9 —	4 9 —	5 0 —
..... American	0 0 —	0 0 —	0 0 —	6 3 —
Beech	2 0 —	2 6 —	2 6 —	2 6 —
Elm	2 0 —	3 3 —	3 3 —	3 3 —
Ash	2 2 —	3 3 —	3 3 —	0 0 —
Scots Fir, planted	0 0 —	2 0 —	2 0 —	2 0 —
..... natural	0 0 —	2 8 —	2 8 —	2 8 —
Fir, Norway (drum)	0 0 —	0 0 —	0 0 —	3 3 —
..... coarse	0 0 —	0 0 —	2 8 —	2 7 —
American Log	0 0 —	0 0 —	4 0 —	4 0 —

PRICE OF OAK BARK PER TON.

	1810.	1811.
	£. S. D.	£. S. D.
Best English Oak Bark	18 10 0 —	16 0 0 —
..... Scots ditto	12 0 0 —	12 12 0 —
..... Danish	8 0 0 —	7 15 0 —

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